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What Circular Saws can do.

In a letter received from H. A. Hoyt, of Buffalo, N. Y., it is stated, that in a mill owned in that place, by J. A. Perry, our correspondent and another young man, sawed out 14,730 feet of boards in nine hours and a quarter, on the 15th of last November, and on the next day, the 16th, they sawed out in the same period of time, 14,950 feet.

Wadley & Reppard, of 77 Mile Post, Central Railroad, Ga., state that the Athens (Geo.) Steam Co., built for them a circular saw mill, with which they sawed 4,877,000 feet of lumber, from 17th July, 1854, to 17th Jan. 1855—about 11,000 feet per day, during the time of working. The stuff was about one half railroad stringers, 6 by 9 inches, and the balance weather-boards, floorings, and two inch plank.

More on the Same Subject.

This will certify that we cut on November 6th, 1855, two poplar logs, that made 1287 ft. of boards, in one hour, including the time of putting on the last log, and twice stopping to oil machinery, on one of Sharps, Davis, & Bonsall's circular saw mills, made for us. Boiler 40 inches diameter, two 15 inch. flues, 14 feet long; engine 7 inch. bore, 17 inch. stroke, saw 54 inch.

JAMES F. PATTERSON,
WILLIAM YAW,
JAMES M. NOBLE.

New Concord, Ohio.

What One Saw Did.

MESSRS. EDITORS—I noticed in a late number of the SCIENTIFIC AMERICAN "what one saw did" in California. Well, I will admit California is a fast place, but I think we can go ahead of it in sawing. In February, 1855, we were sawing lumber for a railroad bridge on the Central Railroad near Lewistown, and we sawed 140,000 feet in ten days, sawing from ten to twelve hours each day, and on one day sawed 20,000 feet in twelve hours. This was sawed on one of George Pages' mills by William L. Bush, sawyer.

Hollidaysburgh, Pa. R. LYTLE.

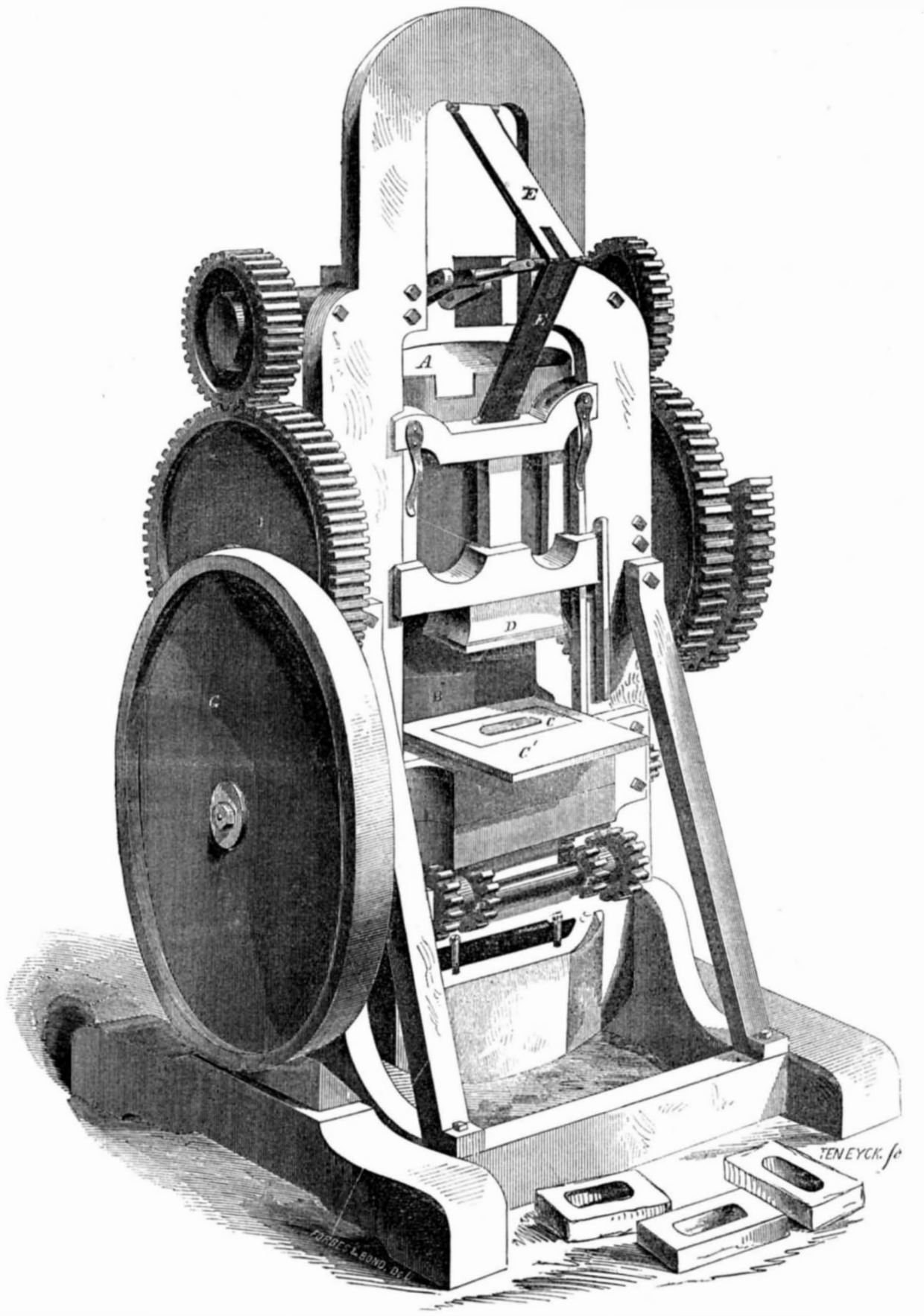
New Brick Machine.

The improvement illustrated by the accompanying engraving is a machine for forming and pressing what are known as "Hollow Bricks." These consist of bricks made of the usual materials and in the common form, but with an oblong aperture pressed through their centers. Specimens are shown in the engraving at the foot of the machine.

One of the chief objections to the erection of brick dwelling houses, especially in the country, is their tendency to absorb and retain moisture. This evil is so great, in some cases as to render it impossible to paper the walls, of apartments; the water strikes through, mildews and stains the paper, destroys pictures, clothing, or other articles that happen to be in contact; the atmosphere within the house is sometimes rendered unhealthy, and sickness is produced, while the stability of the wall itself is impaired. It is said that a single dry brick will absorb, in its pores, a pint of water.

Experience has proved that when walls are built double with an air space between, the evil results of moisture absorption are avoided.

MACHINE FOR MAKING HOLLOW BRICKS.



This has led to the introduction of hollow bricks, and it is found that single walls of this material are just as dry and durable as double walls of solid bricks, arranged as we have mentioned. Hollow bricks are rapidly coming into use in various parts of the country. Any improvement which cheapens their cost or facilitates their manufacture is important, and deserves careful attention.

In the present machine the clay out of which the bricks are formed is placed in the hopper, A, whence it falls into the movable box, B; the latter has a reciprocating movement, and alternately comes forward over the mold, C, and then returns back to the position seen in the cut. Box B has an open bottom, and slides on the table, C', when, therefore, box B comes forward, some of the clay contained within falls into and fills mold, C; the box then returns beneath hopper, A, and receives a new load of clay, while the plunger, D, comes down and presses the clay into the mold, C, with tremendous force. Plunger D is attached to a frame, which moves up and down in the frame of the machine; the plunger frame is operated, as will be seen, by the toggle joint levers, E, which, in their turn, are connected by pitman and crank to the driving part of the machine. The brick is thus pressed with great power.

Within the mold, C, there is another plunger, (not shown) which, at the proper moment rises, and throws up the pressed brick level with table, C', so that it can be removed. This secondary plunger is operated by pinions, F F, which move suitable racks. Motion is communicated to the machine through band wheel G, the various parts being connected and made to operate at the proper instant by means of gearing and other devices.

This machine is simple, strong, operates with great rapidity, is very convenient, presses the brick in a very direct and sure manner, leaves all the edges sharp, &c. It is the invention of Messrs. M. & J. H. Buck & Co., of Lebanon, N. H., from whom further information can be obtained. Measures have been taken to secure a patent.

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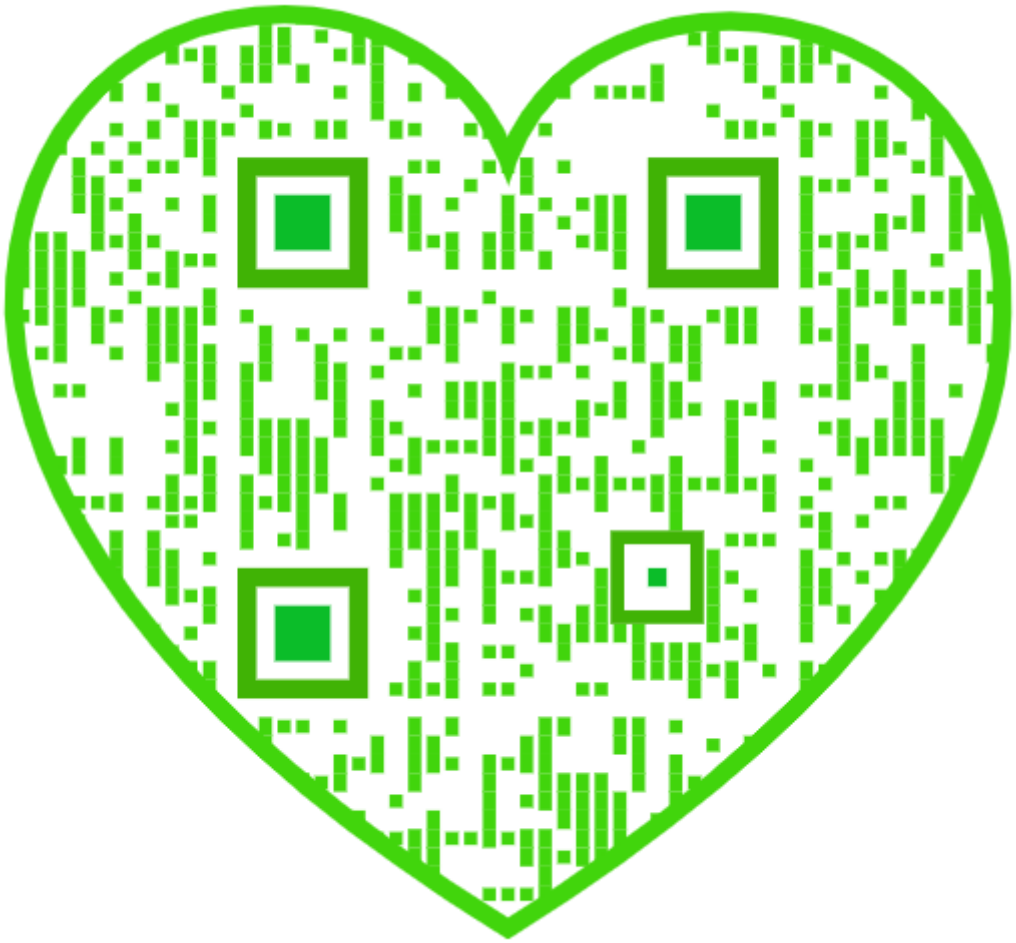

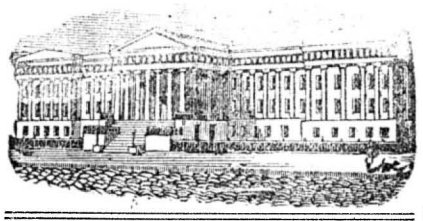

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING APRIL 22, 1856.

GAS BURNERS—William F. Shaw, of Boston, Mass.: I claim the interposition of an imperfectly conducting body between the tip and base of gas burners for the purpose of preventing the conduction of heat away from the point where the gas is burned.

WORKING SHEET METAL—Samuel R. Shepard and Orson W. Stow, of Plantsville, Conn.: We claim the adjustable rotating guide, H, attached to either of the rollers, G, constructed and arranged substantially as described for the purpose specified.

PREVENTING NOCTURNAL EMISSIONS—L. D. Sibley, Northampton, Mass.: I claim the combination of an elastic strip or strips with an internally toothed ring in such a manner that the strip or strips shall serve as a protection against the teeth until the distention of the penis takes place when it or they will yield to said distension and allow the teeth of the ring to act substantially as and for the purpose set forth.

I also claim forming the notches in the edge of the slide, n, in combination with the spring catch, o, arranged and operating substantially as and for the purpose described.

CONICAL TENT—Major H. H. Sibley, U. S. Army: I claim, first, so constructing the tripod, or its equivalent device, attached to a single pole as to admit of easily building a fire, for the purposes set forth.

Second, so constructing the tent, as described, with its hood or cowl, in combination with the door and half door or opening to effect ventilation and the escape of smoke.

FASTENING LAMPS TO LANTERNS—Emile Sirret and Wm. H. Scott, of Buffalo, N. Y.: We claim constructing the lamp with the bottom extending so as to form an annular flange, which may be revolved with the lamp independently of the base of the lantern, for the purpose of attaching the lamp to the lantern, in the manner substantially as described.

PROJECTILES FOR FIRE-ARMS—Thomas Smith, of Pittsburg, Pa.: I claim the construction of balls or projectiles for smooth bore or rifle bore fire-arms with a spiral cavity, more or less funnel shaped, passing longitudinally through them, for the purpose of giving them a spinning motion on their long axis in their passage through the air.

GRAIN SCALE—Nathan M. Phillips, of New York City: I claim the application of an electro-magnet to open and close the valves of a scale for weighing grain by making a connection between the positive and negative poles of a galvanic battery by means of the tilting or raising of the beam described and for the purposes set forth or any analogous arrangement substantially the same.

MEASURING FAUCETS—Edwin A. Palmer, of Clayville, N. Y.: I do not claim any of the principles involved in the common faucet or stop cock.

But I claim the perforated piston, F, in combination with the valve, b, and knob, E, arranged substantially as described and for the purposes set forth.

RAISING AND LOWERING CARRIAGE TOPS—Alanson Quigley, of Sheldrake, N. Y.: I claim the box, B, cog lever, A, pawl, D, and cog wheel, C, in combination.

CAST-IRON PAVEMENTS—Asa P. Robinson, of New York City: I do not claim the application of cast-iron to the purpose of a street pavement or a street railway.

Neither do I claim pavement blocks of a cylindrical form or with any particular form of surface.

But I claim the cylindrical form with the tangential flat surfaces raised upon its circumference, as described, for contact between the blocks.

And I also claim the peculiar manner, as described, of keying the blocks together and of keeping the blocks to the rails to prevent vertical motion and to admit of any one block or rail or any number of blocks or rails being moved without disturbing others not required to be moved by means of the triangular formed spaces, I, the rebates, F, and the keys, 4, or by means of the projecting surfaces of the blocks, A, and the flanges or lugs on the rails, D, and the key, or any similar equivalent arrangement, a set forth.

FISHING TACKLE—Julius T. Buel, of Whitehall, N. Y.: I claim, first, a hook with two barbs, A A', substantially as and for the purpose set forth.

Second, making the hook having two barbs, A A', in two parts, and uniting said parts loosely together, so that one shall turn free of the other, substantially as and for the purpose set forth.

Third, combining with the barb, A, one or more minnow barbs and having one of the barbs turn free of the barb, A, substantially as and for the purpose set forth.

SEEDING MACHINES—George J. Bitler, of Lancaster, O.: I do not claim a perforated reciprocating slide, H, for it has been previously used.

But I claim the reciprocating slide. H, having different sized holes, c, made through it, in combination with the adjustable bottom, G', and adjustable plate, I, said slide, H, being also arranged in combination with and operated by the pulley, K, substantially as shown for the purpose specified.

SOWING FERTILIZERS—Warren S. Bartle, of Newark, N. Y.: I claim the distributors composed of the radials, r r r, in combination with the shaft, k k' k', and fender u, constructed and arranged substantially as described.

BALANCED SLIDE VALVE.—Alexander Buchanan, of New York City: I claim the means of maintaining the differential pressures on two sides of the valve necessary for balancing the same, that is to say, the combination of an apparatus substantially as described with the valve, as set forth.

BRICK MACHINES—Patrick S. Devlan, of Reading Pa.: I claim in combination with a stationary mold and a reciprocating piston or plunger an intermittently rotating feeding and conveying apparatus through which the plunger passes to compress the clay and form the brick, and which remains to receive the brick as it is ejected from the mold and carries it forward out of the way of the succeeding clay box, the whole being operated by an arrangement of devices substantially as described.

CULTIVATORS—George Easterly, of Heart Prairie. Wis.: I claim the hanging of two or more plows to a supporting beam or axle by swiveling joints at each of the ends of their drag bars, so that said plows may be moved either way laterally without affecting the axle and still maintain their parallelism, and this I claim whether the stock to which the plows are connected be adjustable in the drag bars, or the plows be adjustable in the stock or otherwise, substantially as described.

DIGGING PEAT—Abraham Fitts, of Worcester, Mass.: First, I claim the movable knife or fork, M, as described.

Second, I claim the digger, consisting of two or more blades, in combination with a movable knife or fork to cut the third side or sides, constructed and operating as set forth.

Third, I claim the combination of the digger, the crane and the platform or cars to hold them and receive the peat.

FLASKS FOR MOLDING—James J. Johnson, of Alleghany, Va.: I claim the employment of the table, C, follow board, N, and plate, R, constructed and arranged as described the whole when adjusted by the vertical movement in guides being for the purpose of casting smoothing irons, &c.

ELECTRO-MAGNETIC PRINTING TELEGRAPH—Albert J. Partridge, of Southbridge. Mass.: I claim the described method of operating the circuit changer, S, to change the circuit by means of the clutch, x x', and fly wheel, x''', attached to the loose part thereof.

REVOLVING FIRE-ARMS—Gustav A. Blittkowski and Frederick W. Hoffman, of New York City: We claim, firstly, effecting the ramming of the cartridge by means of the fixed rammer, in combination with the reciprocating breech chamber as described.

Secondly, the arrangement for holding and releasing the cartridges, consisting of the clamp spring the knob upon the axis of the breech chamber or its equivalent, and the magazine for containing a supply of cartridges.

Thirdly, effecting the several motions required for operating the rotating breech by means of an axis rigidly connected thereto and operated from one of the ends of said axis as described.

Fourthly, the combination of the slide, h, with the axis of the breech chamber, with the locking bolt, i, and with the tumbler, o', or the mechanical equivalents of said parts for the purpose set forth.

RECEIVING MAGNETS FOR TELEGRAPHS.—Andrew Coleman, of Perth Amboy, N. J.: I claim so constructing or arranging the armature and applying the spring, e, or its equivalent, substantially as described, that the armature constitutes the whole or part of a variable lever, which causes the effective force of the spring, or its equivalent, to increase or diminish as the magnetic force becomes greater or less when this is combined with the so applying the finger, g, by which the local circuit is opened and closed that the said finger is caused to move with the armature by friction only, or its equivalent, and after having moved the slight distance necessary to open or close the circuit, leaves the armature free to move as far as necessary independently of it, substantially as described, thereby obviating the necessity of manual adjustment of the armature to compensate for variations of magnetic force.

WASTE DEVICE FOR HYDRANTS—John Culver, of Baltimore, Md.: I claim the described arrangement of the plunger relative to the discharge pipe, and capable of elevation proportional to the capacity of said pipe for forming a chamber in the lower portion of the hydrant for the reception of the contents of the discharge pipe, substantially as and for the purposes specified.

DOOR LOCKS—John B. Erb, of Strasburg, Pa.: I claim the devices of the knob, H, oval slot, K, and semi-circular slide, G, as they oporate upon the bolt, 5, all in combination substantially as described.

SUGAR EVAPORATORS—Samuel H. Gilman, of New Orleans, La.: I claim, first, the treble bottom, g h i, forming the steam chamber, p, below and the condensed water chamber, q, above, in connection with the steam pipes, c, open at both ends and fixed into the division plate, h, and with the evaporating pipes, b, closed at the top and open at the bottom and fixed into the tube plate, g, all combined substantially as described and for the purposes set forth.

Second, the compensating condensed water syphon pipe, d d' d'', with one leg, d', starting from the reservoir, m, in the steam chamber, and passing up through the division, h, and the tube plate, g, into the pan to about one-half of the hight of the evaporating pipes, b, then turning down through the tube plate, g, and in the same vertical plane with and terminating in and near the lower end of the condensed water pipe, n, of the condensed water chamber, q, substantially as described and set forth.

DRIVING SPOKES—Christian Haas and John C. Noll, of Chicago, Ill.: We make no claim to the driving arrangement separately considered.

But we claim the adjustable hub bed and spoke guide in combination with the driving apparatus, the several parts being constructed and arranged substantially as and for the purposes set forth.

HOTEL ANNUNCIATORS—Wm. H. Hale, of Worcester, Mass.: I do not claim the device of tilting number plates to denote which number is wanted, as it is not new.

But I claim the combination of the number plate with a hammer, whereby I am enabled to show the number and strike the bell with the same piece,

Also I claim the arrangement of said tilting number plates or number hammers, or their equivalents, in ranks, upon ranks of wires, respectively operating them, the wires passing through slots in the hammer levers substantially as described.

DAMPERS OF COOKING STOVES—Wm. E. Hayes, of Geneva, N. Y.: I claim the dampers J and K, connected and operated by the lever, N, and damper rod, M, in the manner and for the purposes specified.

STEAM BOILERS—C. B. Hoard, of Watertown, N. Y.; I claim closing the openings or man holes in one or both heads of boilers by the insertion of a flue which may be conveniently removed and replaced, substantially as described.

PHOSPHORIC ACID AS A SUBSTITUTE FOR OTHER SOLID ACIDS—Eben N. Horsford, of Cambridge, Mass.: I claim the pulverulent phosphoric acid for neutralizing alkaline bases and producing carbonic acid at will from a mixture of this pulverulent acid with alkaline carbonates upon the addition of moisture or heat or both.

SUSPENDING EXTRA TOPSAIL YARDS—George Hubbard, of Stonington, Conn.: I claim, in the application of the extra yard, arranging the same or its connection with the mast above the cap of the lower mast-head and applying said extra yard to the topmast and suspending it from or near the tresseltree by means essentially as described, whereby said yard may not only be raised up towards said tresseltree but be supported in the manner set forth and be capable of being braced around as occasion may require, and this without danger of injury to the cap of the lower mast-head.

COAL BREAKERS—Thomas Petherick, of Pottsville, Pa.: I claim the described mode of breaking coal by causing it to fall from a suitable hight and between proper guards or guides upon sharp pointed teeth and chisels placed on blocks, the whole being arranged and constructed substantially in the manner and for the purses set forth.

REGULATING APPARATUS FOR STEAM HEATING BOILERS—G. S. G. Spence, of Boston, Mass.: I claim the described peculiar arrangement of the steam generator or boiler, B, the stand pipe, H, the condensing apparatus, composed of the receiver, F, the cover, M, and the refrigerating vessel, G, the safety valve and its pipe, I, the whole operating together, substantially as specified.

WEATHER STRIP AND LOCK FOR WINDOWS, &C.—Alfred Speer, of Passaic, N. J.: I am aware that hinged flanges have been attached to doors and door frames, so as to operate by the door knob, and to produce the double effect of a weather strip and lock; I therefore do not claim all contrivances that produce this double effect.

I claim the combination and arrangement of the devices for operating a weather strip or strips, as described, to effect the double purpose of a weather guard and lock at the same time, as set forth.

COTTON CLEANERS—J. H. Kinyon and James Hollingsworth, of Chicago, Ill.: We are aware that Alex. Jones has represented in his patent of April 25, 1837, two machines united in one frame, but they have no necessary connection with each other, nor is there any part of the operation of cleaning or feeding that is common to both machines, as in ours. We do not therefore claim the uniting together of two machines.

But we claim so arranging the hopper, R, feed rolls, F' F', and brushes, S S, as that they shall draw in the material, divide it into nearly equal parts, and throw one half in one direction, and the remaining half in a contrary direction. to be acted upon by other rolls and brushes, as set forth.

SUBSOIL PLOWS—Pells Manny, of Waddam's Grove, Ill.: I claim the combination of the circular rotating coulter, G, separating wing, H, model board, D, and bar F, arranged substantially as shown and described.

HOOP MACHINE—Geo. W. Holmes, of Buckfield, Me., (assignor to J. C. Marble, of Paris, Me.): I claim the arrangement and combination of the pressure rollers, the saw, and the stand guard, as specified, and so as to operate together and for the purpose as set forth, the said rollers being pressed towards the saw with variable degrees of pressure, as explained.

And under the arrangement of the saw and pressure rollers, as described, I claim making the saw dishing or concavo-convex by which advantages are gained, as stated.

CORN HARVESTERS—R. C. Mauck, of Conrado Store Va., and W. T. McGahey, of McGaheysville, Va.: We claim, first, the rotary arm, p, in combination with the packing guides, q, for effecting the filling of the body, substantially as specified.

Second, the employment of a double series of cutters for cutting the stalk and stump, as described, and thereby admitting of the delivery of the cut product without elevation.

HYDRO-CARBON VAPOR LAMPS—Alonzo M. Mace, of Springfield, Mass.: I am aware that it is not new to provide a wick tube with a retort, and to heat such by a separate burner or a separate wick tube.

And I am aware that it is not new to provide the wick tube with a bulb or retort to extend the wick into it, so as to fill it, and to have jets or holes made in the tube or bottom of the retort or bulb, so that the flame thereof would only impinge against the bottom of the retort, the same being described in a patent granted Aug. 27, 1850, to Clayton and Bailey.

I do not claim any such devices; but I claim the particular arrangement of the bottom of the retort, and the jet holes, e e, with respect to the wick tube, whereby the enflamed jets of vapor issuing from the jet holes, e e, are driven downward against the wick tube, and their currents of heat made to ascend against the concave bottom of the retort, as specified, the same serving to greatly facilitate the generation of vapor, as well as the heating of the same.

I also claim combining with the retort the bell-shaped cap or heat retainer, G, made of transparent or other proper material, the same being arranged substantially in the manner and for the purpose as set forth.

SAWING MARBLE—James Miller, of Buffalo, N. Y.: I claim the combination of the crank shaft mounted above the saw frame, the loosely jointed pitman, and the rocking bars vibrating on fulcra upon the adjustable frames which guide the saws, operating substantially and for the purpose set forth.

CORN SHELLERS—A. H. Stevens, of Warsaw, N. Y.: I claim, in combination with the shelling surfaces. the wings, z, openings, y, and spiral flanges or ribs, d, for the purpose of creating and driving through the machine a blast or current of air, for separating the grain from the other impurities, substantially in the manner and for the purpose set forth.

R. R. CAR AXLES—Richard Vose, of New York City: I do not claim the use of an embracing tube, for holding the inner ends of a divided axle, as that has been similarly used before.

But I claim the connecting segments, c c, when combined with the inner ends of a divided axle, and the embracing tube, d, substantially as set forth.

COFFEE POTS—C. B. Waite and J. W. Sener, of Fredericksburg, Va.: We do not claim a condensing coffee boiler.

But we claim the arrangement described, whereby the steam from the boiler is discharged into the water in the condenser which absorbs the aroma, in combination, for returning the contents of the condenser into the boiler, substantially as set forth.

LINK GEARING FOR HORSE POWERS—T. D. Burk, of Chicago, Ill. (assignor to J. C. Miller and C. A. Fowler): I do not claim the horse power consisting of the roller moving in a circular path about a center, as that is old; neither do I claim the universal joint swivel or other parts by themselves.

But I claim the described mode of converting the motion of an axis rolling around a center, into an alternating motion at right angles to the plane described by the rolling axle, by means of the combination of the crank. E F, connecting link, G, universal joint, H, and swiveling bolt of the same, substantially as set forth.

WIRE FENCES—T. D. Burk, of Chicago, Ill. (assignor to James Garrett, of Ogle County, Ill.:) I claim the application of the key, the lever, the weight, and the stay to a wire fence, as and for the purposes and uses specified.

AUGER—Kelsey Curtis (assignor to Winsted Auger Co.) of Winchester, Conn.: I claim the making of an extension bar, connecting the small screw on the end of the auger or bit, with the lips or cutters of the auger proper.

COMPLETING THE THROW OF THE VALES OF DIRECT-ACTING ENGINES.—Henry R. Worthington, of Brooklyn, N. Y.: I claim completing the throw of steam valves of direct-acting engines. by the steam already within the cylinder on its way to the open air or to a condenser, as set forth.

SHOVEL AND TONGS—Samuel Huffman, (assignor to Samuel Huffman and J. D. Brown,) of Richmond, Va.: I claim the flange, b' and the plate, a, when combined with a pair of tongs, in the manner described, for the purpose of forming an instrument capable of being used either as a shovel or tongs, as specified,

TUNNELING AND QUARRYING—Ira Merrill, (assignor to Ira Merrill and Arthur Maxwell,) of Shelburne Falls, Mass.: I do not claim the working of rock in quarries or tunneled avenues, by means of serial grooving, nor the construction of a machine for such purpose, nor the cutting of delicate grooves by the arrangement of the working parts of such machine upon each side of its principal frame alternately.

I only claim the arrangement of the proportionate levers, as and for the purpose mentioned.

STUDS FOR WEARING APPAREL—Lucius Paige, of Cavendish, Vt. (assignor to himself and A. L. Lincoln, of Boston, Mass.): I am fully aware that it is not new to make a shirt stud or button, with a wire shank extending from its center and bent around in a helix or spiral form.

I do not claim the same, nor the principle of the screw contained therein.

But I claim constructing the back disk holder of an ordinary shirt stud or button, with the slit, d, extending from its circumference to the shank, and having one of its edges raised with respect to the other, substantially as specified.

LOOMS FOR WEAVING BAGS—S. F. Thomas, of Lawrence, Mass.: I claim, in combination with the compound cam, K, the endless chain or belt, P, and the mechanism for moving the switch, r, the whole being arranged substantially as described, and for the purpose of determining the length of the sides or when to form the bottom of the bags, as specified.

I also claim the arrangement by which uniform tension of the warps is secured during the movements of the harnesses, or in other words, I claim combining with the breast roller or beam, mechanism, arranged substantially as described, by which the breast roller or beam may be moved with respect to the lay or harnesses, and during the movements of the latter, as specified.

ADDITIONAL IMPROVEMENTS.

GRASS HARVESTERS—George Esterly, of Heart Prairie, Wis. Patent dated originally June 27, 1854: I claim connecting the projections, A, which are on alternate sections of the sickle to the bar, L, so that the said bar may be on top of said sections, as set forth.

DESIGNS.

CASTERS—Wm. H. Green, of Meriden, Conn.

STOVE PLATES—Harvey Smith and F. A. Sheldon, of Troy, N. Y.

Death of a Distinguished Inventor.

Robert L. Stevens died at his residence in Hoboken, N. J., on the morning of the 20th ult., at the age of 68 years. He was a man distinguished for inventive genius, and his name has been associated with improvements in steamboats from the very origin of steam navigation. His father, Col. John Stevens, was also a distinguished inventor; was the friend of John Fitch, and the rival of Oliver Evans, of Philadelphia. Between these two —Evans and Stephens—there was always a generous strife in trying to out-do one another in getting out new and astonishing inventions relating to steam navigation. Col. John Stevens was the first inventor of the screw propeller and tubular boiler—the latter he secured by patents in America and in England. In 1804 he constructed a steamboat 25 feet long, which was propelled by a stern wheel, had a tubular boiler, and a rotary engine. The latter failed to work satisfactorily, was taken out, and one of Watts' put in, with which the little boat made several trips on the North river, running at the rate of from four to six miles an hour; but it had many defects. Under the education of such a father was Robert L. Stevens reared. He was 19 years of age when Fulton's first steamer, the *Clermont*, made her first trip to Albany, and he followed in the footsteps of his father by devoting his energies to improvements in American steam navigation. He made a number of valuable improvements, but, as has happened with all inventors, many of his plans also resulted in failure, owing to their defective character. He was the first person, it is said, who improved the models of our river steamers by extending their bows—giving them a fine sharp entrance and a clean run aft—thereby nearly doubling their speed, without much increasing their engine power. In 1812 he invented a destructive bombshell, which was bought by government, and for which he received a pension. When the Erie Canal was proposed to be built, he suggested, at that early date, a railroad through the center of the State. He always owned a number of steamboats, which were kept running on various routes, especially on the Delaware and Hudson rivers, and he was the owner of the famous yacht *Maria*, on which he worked with his own hands, and which beat the *America* before the latter was sent over to Europe to vanquish the whole of the Royal Yacht Squadron.

For a number of years, lately, he has devoted himself, under the government, to the construction of a famous ball-proof floating battery, for the defence of New York Harbor. The amount expended upon it is stated to be $1,000,000, and an application for $250,000 more is now pending before Congress. The outer shell of this battery consists of nine plates of iron, with spaces between them, making a wall twenty-seven inches thick. It is to be so constructed that its ends may be driven into an ordinary ship, and cut it in two. It will be of 700 feet in length, and 70 in width, with a rudder at each end. The work on this battery was conducted with secrecy in an inclosed yard, admittance to which was not permitted. It is designed to carry thirty guns of heavy caliber upon each side, and on deck four Paixhan guns. There will be furnaces in it for heating shot; it is designed to be propelled by engines, so as to be capable of moving its position rapidly.

This famous floating battery, that has cost government so much, will not—so far as we have been able to judge,—add to his reputation. His father was the original proprietor of the Hoboken and New York Ferries, and ran horse boats on them up to 1817. After he died, Robert put on a small ferry steamboat—the first on the North River. He owned much property in New Jersey and in this city, and at his death wes supposed to be worth as much as $2,000,000. Few inventors have had the same means to make experiments. He inherited wealth, and thus had many advantages over others in carrying out his inventions to success.

Decease of a Distinguished Mechanic.

Thomas Rogers, of the firm of Rogers, Ketchum & Grosvenor, Paterson, N. J., so well known as locomotive builders, died in this city on Saturday the 19th ult. The Paterson *Guardian* states that he came to that place about half a century ago, and was at that time a carpenter in poor circumstances. He afterwards became associated with Godwin, Clark & Co. in building cotton and woolen machinery. About 1830 he dissolved partnership with these persons and became one of the firm of Rogers, Ketchum & Grosvenor.

Mr. Rogers was one of the best calculators and most industrious of men. In 1837 he started the building of locomotives. This Company employs about 700 men, and its engines have a very high reputation. Mr. Rogers had been ill for several months, and at the time of his death was 65 years of age. The city of Paterson owes him a debt of gratitude

A new guano island is stated to have been discovered in the Pacific, from which this valuable manure may be obtained without paying a tax to the Peruvian government.

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Children's Aid Society.

We have received the Third Annual Report of this institution; it contains many interesting facts and statements that ought to be widely spread. This Society has for its object the rescuing of children from the haunts and associations of vice and crime, by taking them from the streets of New York, and sending them away to the country, under the care of families, where they may be taught useful employments, and be surrounded by moral influences. During the three years that the Society has been in existence more than two thousand outcast children have been thus provided for. The Report before us contains many letters and statements from children and their employers. No one can read them without being deeply impressed with the importance and nobility of this benevolent enterprise. The general plan is to bind out the boys, who are from 10 to 13 years of age, to an employer until they are 21 years of age. The employer agrees, in consideration of faithful service on the part of the lad, to provide his board and clothing, and pay him a small sum, say $100, when the term of service expires. Girls are bound out to mistresses in the same way. Most of these children are bright, active, ready, and anxious to work and learn.

Perhaps we cannot convey a better idea of the operations of the Society than by copying from the report a few extracts from the letter of a gentleman who went out West from New York City, not long since, with forty-six of the little ones. He says:—

"On Wednesday evening, with emigrant tickets to Detroit, we started on the *Isaac Newton*, for Albany. Our company consisted of forty-six boys and girls from New York, bound westward, and, to them, homeward. They were between the ages of 7 and 15—most of them from 10 to 12. The majority of them orphans, dressed in uniform—as bright, sharp, bold, racy a crowd of little fellows as can be grown nowhere out of the streets of New York. One, a keen-eyed American boy, was born in Chicago—an orphan now, and abandoned in New York by an intemperate brother. Another, a little German Jew, who had been entirely friendless for four years, and had finally found his way into the News-Boys' Lodging House. Dick and Jack were brothers of Sarah O———, whom we sent to Connecticut. Their father is intemperate; mother died in Bellevue Hospital three weeks since; and an older brother has just been sentenced to Sing Sing. Their father, a very sensible man when sober, begged me to take the boy along, 'for I am sure, sir if left in New York they will come to the same bad end as their brother.' We took them to a shoe-shop. Little Jack made awkward work in trying on a pair. 'He don't know them, sir; there's not been a cover to his feet for three winters.'

Another of the ten, whom the boys called 'Liverpool,' defies description. Mr. Gerry found him in the Fourth Ward, a few hours before we left. Really only twelve years old, but in dress a seedy loafer of forty. His boots, and coat, and pants, would have held two such boys easily—filthy and ragged to the last thread. Under Mr. Tracy's hands, at the Lodging House, 'Liverpool' was remodelled into a boy again; and when he came on board the boat with his new suit, I did not know him. His story interested us all, and was told with a quiet sad reserve, that made us believe him truthful. A friendless orphan in the streets of Liverpool, he heard of America, and determined to come, and after a long search found a captain who shipped him as cabin-boy. Landed in New York, 'Liverpool' found his street condition somewhat bettered. Here he got occasional odd jobs about the docks, found a pretty tight box to sleep in, and now and then the sailors gave him a cast-off garment, which he wrapped and tied about him, till he looked like a walking rag bundle when Mr. G. found him.

As we steamed off from the wharf, the boys gave three cheers for New York, and three more for 'Michigan.' All seemed as careless at leaving home for ever, as if they were on a target excursion to Hoboken.

We had a steerage passage, and after the cracker-box and ginger-bread had passed around, the boys sat down in the gangway and began to sing. Their full chorus attracted the attention of the passengers, who gathered about, and soon the captain sent for us to come to the upper saloon. There the boys sang and talked, each one telling his own story separately, as he was taken aside, till ten o'clock, when Captain S. gave them all berths in the cabin; meanwhile, a lady from Rochester had selected a little boy for her sister, and Mr. B., a merchant from Illinois, had made arrangements to take 'Liverpool' for his store. I afterwards met Mr. B. in Buffalo, and he said he would not part with the boy for any consideration; and I thought then, that to take such a boy from such a condition, and put him into such hands, was worth the whole trip.

Landed in Detroit at ten o'clock, Saturday night, and took a first class passenger car on the Mich. C. R. R., and reached Dowagiac, a 'smart little town,' in S. W. Michigan, three o'clock Sunday morning. The depot master, who seldom receives more than three passengers from a train, was utterly confounded at the crowd of little ones poured out upon the platform, and at first refused to let us stay till morning, but after a deal of explanation, he consented with apparent misgiving; and the boys spread themselves on the floor to sleep. At daybreak they began to inquire, 'Where be we?' and finding that they were really in Michigan, scattered in all directions, each one for himself, and in five minutes there was not a boy in sight of the depot. When I had negotiated for our stay at the American House (!) and had breakfast nearly ready, they began to straggle back from every quarter, each boy loaded down—caps, shoes, coat-sleeves, aad shirts full of every green thing they could lay hands upon—apples, ears of corn, peaches, pieces of pumpkins, etc. 'Look at the Michi*gan* filberts!' cried a little fellow, running up, holding with both hands upon his shirt bosom, which was bursting out with *acorns*. Little Mag, (and she is one of the prettiest, sweetest little things you ever set eyes upon,) brought in a 'nosegay,' which she insisted upon sticking in my coat—a mullen-stalk and corn leaf, twisted with grass!

Several of the boys had taken a swim in the creek, though it was a pretty cold morning. At the breakfast table the question was discussed, how we should spend the Sabbath. The boys evidently wanted to continue their explorations; but when asked if it would not be best to go to church, there were no hands down, and some proposed to go to Sunday school, and 'boys' meeting, too.'

The children had clean and happy faces, but no change of clothes, and those they wore were badly soiled and torn by the emigrant passage. You can imagine the appearance of our 'ragged regiment,' as we filed into the Presbyterian church, (which, by the way, was a school house,) and appropriated our full share of the seats. The 'natives' could not be satisfied with staring, as they came to the door and filled up the vacant part of the house. The pastor was late, and we 'occupied the time' in singing. Those sweet Sabbath school songs never sounded so sweetly before. Their favorite hymn was, 'Come, ye sinners, poor and needy,' and they rolled it out with a relish. It was a touching sight, and pocket handkerchiefs were used quite freely among the audience.

At the close of the sermon the people were informed of the object of the Children's Aid Society. It met with the cordial approbation of all present, and several promised to take children.

Monday morning the boys held themselves in readiness to receive applications from the farmers. They would watch at all directions, scanning closely every wagon that came in sight, and deciding from the appearance of the driver and the horses, more often from the latter, whether they 'would go in for *that* farmer.'

There seems to be a general dearth of boys, and still greater of girls, in all this section, and before night I had applications for fifteen of my children, the applicants bringing recommendations from their pastor and the justice of peace.

There was a rivalry among the boys to see which first could get a home in the country, and before Saturday they were all gone. Rev. Mr. O. took several home with him, and nine of the smallest I accompanied to Chicago, and sent to Mr. Townsend, Iowa City. Nearly all the others found homes in Cass County, and I had a dozen applications for more. A few of the boys are bound to trades, but the most insisted upon being farmers, and learning to drive horses. They are to receive a good common school education, and one hundred dollars when twenty-one. I have great hopes for the majority of them. 'Mag' is *adopted* by a wealthy Christian farmer. 'Smack,' the privateer, from Albany, has a good home in a Quaker settlement. The two brothers, Dick and Jack, were taken by an excellent man and his son, living on adjacent farms. The German boy from the 'Lodging House,' lives with a physician in D——.

Several of the boys came in to see me, and tell their experience in learning to farm. One of them was sure he knew how to milk, and being furnished with a pail, was told to take his choice of the cows in the yard. He sprang for a two-year old steer, caught him by the horns, and called for 'a line to make him fast.' None seemed discontented but one, who ran away from a tinner, because he wanted to be a farmer.

On the whole, the first experiment of sending children West is a very happy one, and I am sure there are places enough with good families in Michigan, Illinois, Iowa, and Wisconsin, to give every poor boy and girl in New York a permanent home. The only difficulty is to bring the children to the homes."

If there are any of our readers who feel willing to give employment to such children, they may address C. L. Brace, Secretary of the Children's Aid Society, New York City.

(For the Scientific American.)

Model of Ships.—The Speed of the Merrimac.

Messrs. Editors—In your number for the 22d of March I read an article on the results of an experimental trip made to sea by the new frigate *Merrimac*, and was surprised at having my fears verified almost beyond improbability. Your information concerning the causes of failure bore particular weight against the machinery, leaving it to be inferred by shipbuilders that engineering must have been the profession of your correspondent. Permit me to say that every man, whether of a trade or profession, is best qualified to discover the faults lying in his own line, and while engineers would, perhaps, condemn the machinery, shipbuilders and marine architects would condemn the model. This has been done by the best authorities on improved naval architecture in the United States for the whole number of five of the new frigates which have been built from the same model; in this respect if one fails all will fail. The responsibility must be laid at the door of the Bureau of Construction.

"What does it mean," you inquire, in relation to the model. It means this: Our Naval Constructors (and Engineers too) make very few models and build very few vessels, consequently, their "hand is not in," their mind is not up to the keen tension required for master-pieces of molding skill. The government employs seven Naval Constructors at the various dockyards, and one Chief Naval Constructor. The limited scope for practice in designing vessels of war may be seen at a glance. The government demand for naval vessels has not amounted to an average of two per annum during any period of peace. On the contrary, some of our naval hulks have been from 10 to 20, and even 30 years on the stocks in progress of building.

The practical duties of our Naval Constructors have consisted, for the most part, in repairing and rebuilding old vessels. Practice makes perfection in every art of man. This solution is a practical one, and the only one that can be entertained without arraigning the abilities of our Naval Architects—a disagreeable thing to do.

The Naval Constructor who makes a model but once in five years, perhaps, cannot be expected to keep pace with the mercantile architect who prepares a model, with drafts, for a ship every month in the year; and we can cite an instance where the press of orders from shipbuilders, at home and abroad, has tasked J. W. Griffiths, of New York, to produce new a model and draft every week for the greater portions of two or three years. How can it be possible for the unexercised heads of naval architects to maintain their places by the side of mechanics who carry forward the standard of the age with a practice like this? Experience teaches school; it is scholars only who advance. The government keeps her children at home, or sets them to work to break up hulks and rebuild them. Similar remarks will apply to similar cases. Progress in modeling passes from one type of model to another, and more perfect one for utility. When a Naval Constructor is called upon to lay down a ship, a model first comes to light that he designed, perhaps, twenty years before. Few mechanics carry more than one model in their head at one time. The man whose active and employed brain teems with weekly or monthly productions of models, smiles to find on the government stocks types of ships which his own mind has outgrown. Does Congress know it? Shipbuilders are very few in offices of government. What is the remedy? The mildest and least radical is the establishment of an office of Consulting Naval Constructor, the incumbent to be appointed from among our most eminent mercantile architects—one acquainted also with naval construction preferred, whose counsel shall be incorporated in the design and model of every war vessel to be constructed or rebuilt. We have now a Consulting Naval Engineer; is not the ship of equal importance with the engine?

W. W. B.

A Different Story About the Merrimac.

Excuse me for referring to a Philadelphia paper which quotes some disparaging remarks from you on the U. S. steamer *Merrimac*. I do not believe that you wilfully intended to do injustice to the builders and contractors of that noble ship. You have been misled by wrong information. One of the lieutenants writing to me says:—

"She (the *Merrimac*) is really a magnificent craft. We are proud of her. We tried her every way. Under sail we logged 15 knots, and I hope to see 17 noted. The engine works to a charm. Furnaces consume but 32 tuns per diem, and give us 10 knots and over with the propeller. I believe no screw in the Allied navies can do this. When the engine is polished by use we shall get more. The Chief Engineer is proud of it. What more can I say? She is a successful experiment."

Perhaps the writer in your paper forgets that the *Merrimac* is a screw frigate, and, in fact, a sailing ship, the screw being an auxiliary motor. In the British navy the *Duke of Wellington*, the *James Watt*, and *Prince Albert*, screw line-of-battle ships, have steam power for only six, seven, and eight knots.

Investigator.

Revenue Steam Cutters.

A bill is now before Congress, containing provisions for employing a Revenue Steam Cutter for the Port of New York, and which can be used for the relief of vessels in distress on the coast. Not one, merely, but two or three such cutters should be kept in this port, and there are a number of other ports where such cutters should also be stationed. We hope the bill will pass with the amendments suggested. With such vessels, relief to ships in distress would be prompt and effective, whereas, with the common sailing cutters, relief in most cases required, is impossible. With such an immense revenue as is obtained at the port of New York, it is wrong that so little of it is devoted to the relief and safety of the shipping which brings the money in.

Curious Effects of Cedar.

Professor Fleming, of Edinburg, says that in examining the conchological collection of Lady Agnew, placed in drawers of cedar wood, he discovered that the texture of many shells had changed, as though a coating of caoutchouc had been supplied. The pernicious cedar was from Havana. Watches placed in cedar drawers in the Royal Observatory, in King George the Third's time, stopped, and the oil that lubricated them was changed into gum.

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New Inventions.

Improved Lock for Banks, Safes, &c.

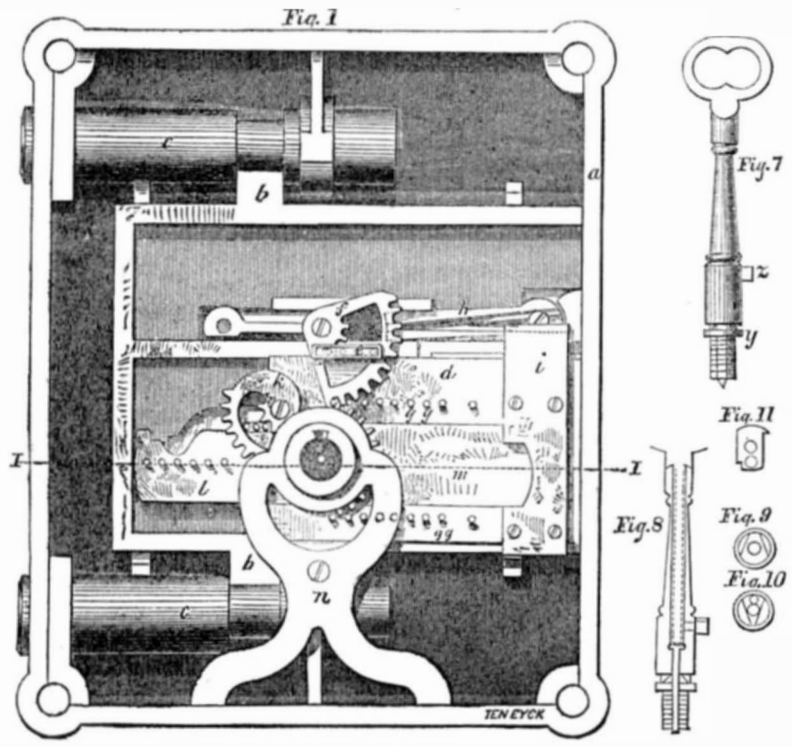
Our engravings illustrate the invention of Linus Yale, Jr., of Philadelphia, Pa., for which U. S. letters patent were granted May 22d, 1855. Patents have also been secured in Europe. The inventor needs no puffing at our hands, as he has already distinguished himself in the science of locksmithing here by picking the Day & Newell Parautoptic, or, as it is better known, the great Hobbs' Lock. This he has done repeatedly, and in a very short time, by making a wooden key from measurements taken through the key-hole. We are told that not only the Parautoptic but all other locks operated by a winged key are worthless as securities before the simple method devised by Mr. Yale. But it will be satisfactory to such to inform them that Mr. Yale—the son of the inventor of the Bacon lock—can furnish them with one perfectly reliable.

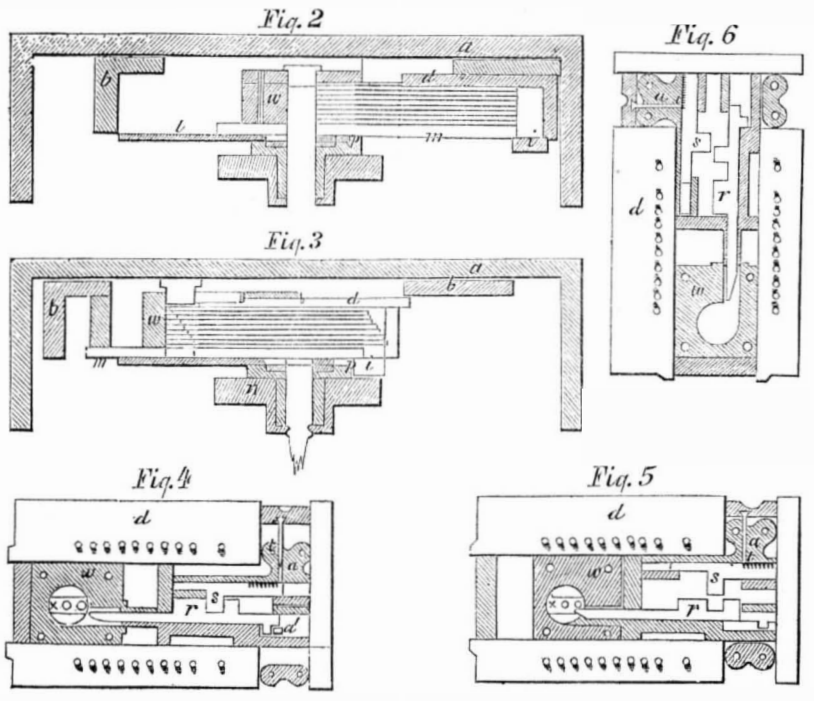
The present improvement is believed by the inventor to be absolutely burglar proof; to pick it is, in his opinion, utterly impossible. Among its advantages are, first, the infallible principle. The lock separates the key bits from the stem of the key, unconsciously to the owner, and carries them into the interior of the lock where they impress the tumblers—the external key-hole being closed up whilst the tumblers are free to act. This prevents Mr. Hobbs' method of picking by feeling; and as the key does not sweep the tumblers in its track, it prevents Mr. Yale's own method of picking by an impression. It has no springs to clog and refuse duty from dirt or rust. The dog which holds the bolt locked out takes all strain that may be applied to it, and by which tumblers of most kinds of locks can be crushed. The double notching the key bits doubles them in number, and vastly adds to the power of permutating the key beyond all ordinary keys—for instance, in an ordinary eight tumbler lock the key can be changed 40,320 times. In this lock, with the same number of tumblers, the changes are 4,314,240.

In our engraving fig. 1 is a plan of the lock in unlocked position; fig. 2 section of lock through line I I from above, key tumblers in normal position; fig. 3 the same, showing the key stem in key-hole, the key-hole closed by hard plate, the key bits carried into the lock, and the key tumblers impressed by them; the cross head is also shown in contact with the driving wheel. Fig. 4 is a plan of tumbler carriage, the hard plate and cross head being removed to show the tumblers in normal position held securely by the pin, a', also the key bits as just inserted, ready to be imprinted on the key tumblers. Fig. 5 is the tumbler carriage as above, showing the key bit in place, with key tumbler as pressed into it, the true tumbler, s, as arranged, moved away from key tumbler, and secured in its place by the knife edge, t, holding it in its notch. Fig. 6 tumbler carriage as above, the fence tumbler anchored by knife edge, the key tumbler back to normal position; this view shows the position of tumblers when the bolts are locked out and key withdrawn. Fig. 7 is the key; z, the square pin on handle which turns the driving wheel; y the key pod attached to the handle by a dovetail and spring dowel. Fig. 8 is a section of key showing spiral spring in handle, and spring dowel to retain the pod from slipping off. Figs. 9 and 10 show the dovetailing of the ends of handle and pod where they unite. Fig. 11 is a key bit with center hole to pass over the center pin, and side hole where the screw passes through it to hold it with the others in key pod.

To Lock—On inserting the key the sliding drill pin presses back the dowel pin in the key and detaches the pod or bits from the key handle, and the square pin of the key enters the notch in the driving wheel. Commencing to turn the handle the driving wheel, p, sets the quarter wheel, f, in motion, which, working in the rack, e, carries the bolt, b, to its locked-out position; simultaneously the driving wheel also matching into the pins, g g g, drives the tumbler carriage, d, to the left, bringing the cross-head, i, in contact with the cam of the driving wheel; the tumbler carriage in its journey carries the detached key pod away from the external key-hole, which is closed up by sliding the hard plate, m, across it. When the key-hole is closed the snail wheel, k, partially checks the advance of the hard plate, releasing the key tumblers, r, from the pressure of the pin, a', which is attached to the hard plate, thus setting the tumblers free to act, the key chamber or pod carrier, w, being screwed to the hard plate partakes of its motion and holds the key bits, which it contains against the advancing tumblers, which are pressed slowly but firmly against the key bits, which give both the key tumblers, r, and fence tumblers, e, the impress of their own arrangement. These motions are effected by about one-third of the revolution of the key handle. Continuing to turn the cam of the driving wheel moves the cross head, i, and through it the bolt dog, h, behind the bolt carriage, and holds it together with the bolts firmly locked-out. The cross head being

IMPROVEMENT IN BANK AND SAFE LOCKS.





screwed to the fence slide which holds and carries the fence tumblers, s, lifts them at the same time out of the key tumblers, r, fig. 5, and on to the knife edge, t, which enters one of the series of notches cut in their backs, holding them firmly in the arrangement given them by the key. In the remaining motion of the key the driving wheel matching into the pins, g g, in the lower side of the tumbler carriage carries it back again; the snail wheel moves the hard plate, and with it the key chamber is drawing the key tumblers away from the key bits, at the same time that the pin, a', is restoring the tumblers to their normal position and securing them immovably, every trace of their action being entirely erased, the key-hole is opened, the key pod presented to the handle again, which, on being withdrawn from the key-hole, is found self-attached.

To Unlock—Insert the key as before; on turning in the reverse direction the key bits are separated from the handle and carried away into the lock as before, the key tumblers arranged by being pressed into the steps of the key bits; the cross head is again brought to the wheel, which now moves it downward, carrying with it the fence tumblers into the key tumblers as they were originally, and also the bolt dog, h, from behind the bolts; the remaining motion of the key handle retracts the bolts, restores the key tumblers, and through them the fence tumblers to their normal position ready to receive a new key, opens the key-hole and attaches the key pod to the handle ready for a withdrawal.

But if, while in the locked position, a changed or false key be applied, and the first one-third revolution effected, the key tumblers are wrongly arranged and not in a position to receive the fence tumblers, which have retained the form of the first and proper key, consequently the fence slide is obstructed in its movements, which in its turn prevents the cross head from coming down, and, of course, it cannot bring down the bolt dog to relieve the bolts which continue to project until all their preceding movements regularly occur.

The bolt cariage, b, carries the round tempered steel bolts, c c, in such a manner that they would roll under the action of a saw; this prevents them from being cut off. The dog, h, takes all the pressure applied to the bolts to force the lock relieving the tumblers from all possibility of being crushed.

No powder can be introduced into the basin of the lock to blow it off. The keyhole alone can be charged, and the explosion would no more harm it than it would a pistol barrel of the same size.

For further information address the inventor at No. 13 Chestnut st., Philadelphia, Pa., or apply to Samuel Hammond, Merchant's Exchange, Wall st., New York City.

Mariner's Time Compass.

Ralph Reeder, of Cincinnati, Ohio, has recently been on a visit to Washington and this city, with a model of his above-named instrument—secured by patent—to make arrangements for their manufacture in this great sea port. The instrument consists of a chronometer, and a horizontal dial, with a style on its face, and a stationary equatorial brass ring laid out in degrees minutes, and seconds. These are supported on a movable axis, forming the focus of a vertical quadrant laid out in angles at each side, so that the angle of dial and ring can be changed by a thumb screw. Below the dial is the common mariner's compass, with a spirit level on its table or standard-top. The instrument is designed to be used with the compass in steering ships. and its object is to indicate the position of the ship at any hour of the day when the sun shines, thus operating as a correcter of the compass, which is liable to be affected by local attraction in iron ships, and by masses of metal such as a cargo of wrought or pig iron.

Wire Rope.

At a meeting of the Mechanics Club in this city on the evening of the 25th ult., William H. Wallace read an able paper on the above subject. He urged the practicability of its application for the most common purposes. He cited its employment with the fullest success for window cords and the like minor purposes, but dwelt with particular force on the applicability of this manufacture to the standing rigging of vessels. He asserted it to be only one-quarter as bulky as hemp rigging of the same strength, and consequently offering much less resistance in sailing by the wind, or in steaming against a gale. It is also but two-thirds as heavy as hemp, and consequently adds materially to the stability of a vessel; and if employed for back-stays, and the chains are extended to meet the copper, a complete lightning conductor is established on every side of the vessel.

The ordinary means employed for protecting the wire was a simple coating of Spanish brown and linseed oil applied thoroughly to each in the process of manufacture The toughness of wire was argued to depend much on the quality of the iron and the annealing process. Mr. Backas gave the Messrs. Washburn, of Worcester, the credit of having made wire on a large contract with which he was connected, the test of which was that it should wind tightly around another wire of the same diameter without exhibiting any roughness when examined by the microscope. The iron employed in this contract was American iron, and proved considerably stronger than that given by English tables.

Mr. Wallace explained the processes employed in laying up the wire at the Roebling Works in New Jersey. The ropewalk is 4000 feet in length, and the greatest care is taken to insure a perfectly equal strain on every strand. The amount of twist, and the fineness of the wire employed depended on the uses for which the rope was intended. Stationary rope is sometimes made from wire as large as No. 5, while tiller ropes are made from fine wires put together with considerable twist.

Cause of the Explosion of the Steamboat Metropolis.

We have not been able to find room in this number for an important communication from Local Inspectors, Haldiman and Guthrie, giving their account of the cause of the recent boiler explosion on the steamboat *Metropolis* on the Ohio river; the letter will appear next week.

Good News for Inventors.

One of our London correspondents writes us as follows:—"The close of the European war will no doubt stimulate American inventors to bring out their good things, for there will be an improved market for patents here in consequence of the Peace."

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Scientific American.

NEW-YORK, MAY 3, 1856.

Experiments with Metals.

In our last number we published some very useful information in relation to castings of cast-iron, derived from the reports of the U. S. Officers of Ordinance, and we will now present some remarks on castings of brass or bronze, derived from experiments in casting bronze cannon at the famous Ames Works at Chicopee, Mass.

Brass founders have often noticed a remarkable difference in the color and quality of castings made from the same molten mass of brass, and have been puzzled to account for this. It is believed by many persons that in forming alloys the metals unite in definite proportions at different temperatures, and that in the cooling of brass castings the particles arrange themselves in a manner not yet well understood, either by scientific or practical men. The experiments made with bronze guns at Chicopee are interesting in relation to this question. A number of small bronze guns were cast, and bars was cut from different parts of them and tested. The material was the same in all cases, 8 parts of copper and 1 of tin; they were all treated alike, and cast from the same molten mass. The samples of bars tested gave an extraordinary variety of results. A bar cut from one part of a gun exhibited a tenacity of 100, while a bar cut from another part of it exhibited a tenacity of 236; and the difference in the density of different parts of the same casting was also remarkable, being equal to 34 lbs. in a cubic foot, thus showing, we conceive, that the metals of alloys do unite in different proportions at different degrees of temperature. Three howitzers were cast from the same molten mass, poured at different temperatures into separate molds. The first was poured at a very high heat into its mold; the metal of the second was kept 15 minutes in the ladle before it was poured in, and the third kept 15 minutes longer still. All the attending circumstances, excepting the temperature of the alloy when poured into the mold, were equal. The liquid metal of the first and greatest heat sank gradually down into the mold for a few minutes after casting, and receded about an inch and a half below its original hight; soon after this it boiled at the surface as if gas were escaping, and fluid portions of the alloy arose and overflowed the top of the mold. The exuded metal congealed like lava, was of a dirty white appearance, and contained more tin than the mass of the casting. When cold the casting was found to be an inch longer than the mold, and it was filled with minute vesicular cavities. The bars cut from it and tested were very low in density and inferior in tenacity. The second howitzer cast fifteen minutes later at a lower temperature was shorter, when cold, than the mold, by nearly two inches. The third, cast at a still lower temperature, was, when cold, three inches shorter than the mold. The density of the bars cut from these three howitzers was greatest in the one cast at the lowest temperature, and as the tenacity follows the same law, it appears that casting brass at a high temperature is injurious to the quality of the casting—the difference in the tenacity of the three castings being as 3 to 1. In reference to this point the report of Major Wade says: "The division of copper and tin into two or more separate alloys probably occurs at some definite temperatures; one division may occur in the liquid mass, and another after the temperature falls below the melting of copper, and the latter probably occurs in all large castings, for on a close examination of any gun casting, some traces of this whitish alloy will be found in some parts of it.

That such a division may occur in the liquid mass, appears evident from the fact, that a portion of the liquid bronze will pass through a porous vessel as through a sieve, while another portion will remain within the vessel. The former is the more fusible alloy, the latter the less fusible, and forms the mass of gun castings. It thus appears that we may sift the more fusible alloy, while both are liquid."

The sifting of the more from the less fusible alloy in the liquid state, and the pouring of the molten alloy into the mold at a reduced temperature, to improve the character of brass castings, is very important information for brass founders. It was also discovered in the course of these experiments with alloys, that small bars of bronze cast of the same metal as the cannon, were vastly stronger than the cannon. This is attributed to the rapidity with which they were cooled, thus preventing the particles changing position in the act of cooling. Although a great deal of information has been published in our columns from time to time, relating to alloys and brass castings, much has yet to be done by men of science and mechanics in investigating their nature, for we are still in the dark respecting the laws which govern their combination. There is still a wide field open here for experiment, which we hope will soon be explored by many industrious and acute experimenters.

Congressional, or Public Books.

MESSRS. EDITORS—I saw a notice in the SCIENTIFIC AMERICAN of books published by the United States Government. What becomes of them, and who gets them? Are they attainable by the common people? When will the Patent Office Report for 1855 be published? C. B. H.

Oriskany Falls, N. Y., April 18, 1855.

[Our correspondent asks a very reasonable question. If our information is correct, a very large proportion of all the best books, printed by Congress, fall into the hands of speculators, and are not attainable by the common people. The object of printing books at the public expense, is to disseminate widely the information they contain. But this result is seldom reached. Each Member of Congress is entitled to a certain number of copies, and he is in duty bound to distribute the same, gratis, among his constituents, in such a manner as shall best insure the spread of knowledge. But the adopted practice, in such matters, is otherwise. Instead of distributing works, for the common good, Members are in the habit of selling them to book speculators, at Washington, and pocketing the proceeds. Each new Member realizes, in this manner, from $800 to $1000 cash—so we are told.

Great energy is exhibited in flooding the country at the public expense, with long-winded, inflammatory, and, too often, worthless speeches. But when documents of value are placed in the hands of Members, their zeal in the diffusion of knowledge experiences a sudden check.

Of the excellent Report of the Commissioner of Patents, for 1854, illustrated with several thousand diagrams of new inventions, *twenty-seven thousand* extra copies, for public distribution, were ordered to be printed. What has become of them? The inventors who furnished the materials for the work, have had scarcely any. Indeed, unless they have influential friends at the seat of government, their chances for obtaining copies of such reports are always slim. This is wrong. The law should expressly provide that every applicant for a patent should receive a copy of the Patent Report.

Some time since a meeting of librarians from various parts of the country, was held in this city. Among other movements, they resolved to memorialize Congress, and ask for the passage of a law to supply every public library with one copy of each public work printed. This ought to be done, for it would greatly facilitate the access of the people to such documents.

Another rule should be, (now we speak for ourselves,) to send copies of all government books to every editor in the country. The works would then pass under review, their contents, and the information they contain, would be made known and disseminated much more widely than could be done in any other manner.

Our correspondent inquires when the Commissioner's Report for 1855 is to be published? Echo answers, When? In the course of the year, perhaps,—when it has become old and stale.

The steamboat *Cuba* exploded her boilers on the Alabama river on the 20th ult., by which accident several persons were killed.

Amending the Patent Laws.

Two propositions for amendments in the Patent Laws have just been presented to the Senate. One of them relates to fines for deceiving the public by stamping articles "patented," when in fact no patent exists. The bill proposes to fix the penalty at not less than $5, nor more than $100 for each article so stamped. The Jury to assess the amount of the penalty, but no fine exceeding $2,000 in the aggregate, for making such false representation on any articles of the same kind in any one year, shall ever be recovered against any person All actions to be brought within two years.

The *Evening Post*, of this city, says that the above amendment is "adapted to remove some of the serious annoyances and obstructions now so much complained of by the mechanical inventors in the country."

We should most heartily join in any effort to procure greater security against bogus patentees, but it strikes us that the foregoing project is a step backwards. The existing law fixes a penalty of not less than $100 for each offence, as above, does not leave the fine to a jury, nor qualify the aggregate amount, or time of action. In short it punishes the offender fully, for each offence, whenever it can catch him. The jury have nothing to do with the penalty, but only to say "guilty," or "not guilty." The *improvement* which is proposed, reduces the fine to $5, gives the offender the choice of clearing his skirts for the sum of $2,000 cash, no matter how many times he has violated the law, or lets him off scot-free if he can manage to keep the subject hushed up for 24 months.

The other amendment to which we have alluded, is a proposition to permit the people of Canada and the other neighboring British Provinces, to obtain United States Patents on the same terms with our own citizens. This is a good move, and we should like to see it adopted. Were it not for the light of the Golden Rule, we should be inclined to exclude the Canadians and Nova Scotians altogether. They have done so towards Americans, for some few years past, and still adhere to their exclusiveness. They have always enjoyed the privilege of coming here to secure patents for their new inventions on the same terms as other Englishmen; but they utterly refuse to grant patents to American citizens under any consideration whatever.

The Province of New Brunswick, however, is a noble exception. Americans are at liberty to take out patents there whenever they choose, and the expense is quite small. New Brunswick has always been noted for the liberality and intelligence of its inhabitants. It is a thriving and populous colony.

Notes on Ancient and Curious Inventions.—No. 5.

Cordials—In days past and gone, cordials were *cordials*, because they were patent cordials. In 1802, Simon Lazarus, of Virginia, obtained a patent for an anti-bilious cordial, and in 1804 Samuel Chamberlain, of Massachusetts, obtained one for a "bilious cordial." Five years afterwards, Antonio Bouchere, of Philadelphia, obtained one for a cordial gin, which we have no doubt was as good, and perhaps better, in its day, than the much vaunted and puffed "Scheidam Schnapps," of the present.

Pills—There was a time when pills were really pills; and they have left forcible demonstrations of their effects upon the rolls of the Patent Office; no less than eighteen different patent pills having left their marks upon those records. The first patent pill was that of S. Lee, Jr., of Connecticut, in 1796. Connecticut appears to have carried off the palm in pill making—one half of the pill patents having been taken out by citizens of that State. Lee's Connecticut pills were famous in their day, for we find that Samuel Lee obtained two patents, and Samuel H. P. Lee two,—all of the bilious order. Two kinds of anti-dyspeptic pills were patented, and three of rheumatic pills; the rest bore the names of "family pills," "tonic pills," &c., and were no doubt powerful instruments for good or evil, according as they were used.

The last patent that we find granted for an American pill, was that of John J. Oellig, of Waynesborough, Pa., on the 28th October, 1837. It was termed a "tonic aperient pill," and, as being the last of its race, its composition is worthy of being known. It consisted of crab apple root bark, 1 1-2 drams, rhubarb, 2 drams; extract of horehound, 28 grains; sal soda, 2 scruples, and castile soap sufficient to make the mass into 150 pills. The latest patented pill that we have any knowledge of, is that of A. H. Hardy and J. H. Fordoff, in England; the patent was granted, on the 25th of August last. Its composition consists of jalap, one ounce; aloes, extract, one ounce; buckthorne, one ounce; oil of almonds, one grain; calomel, one grain—all well mixed with a little sugar, and made into very minute pills. The same patent embraced an ointment, to be used with the pills, for curing scrofulous disorders. It consisted of white precipitate, red precipitate, oil of origamme, and turmeric, beat up with lard, in equal parts.

Medicines generally.—Townsend's Sarsaparilla has obtained rather an extensive reputation, but the Sarsaparilla Mead of Jonas C. Brigham, of Methuen, Mass., patented July 25, 1833, was no doubt as good. Some queer patents relating to medicines have been granted, and some of these are worthy of being extensively known. We find that Joseph Baker, of Jefferson, Ohio, obtained a patent on May 5th, 1831, for a medicine to cure fevers, rheumatism, dropsy, dysentery, consumption, pleurisy, boldhives, &c. &c. Seneca snake root, one ounce; liverwort tops, three-fourths of an ounce; plaintain roots and tops, one-quarter of an ounce. These were dried, pounded, and mixed well together, and formed part of the medicine. Sasafras root bark, half an ounce; the inside bark of wild cherry, half an ounce, and sulphur half an ounce. These, in a dry state, were ground and mixed together, and formed part second of the medicine. The third part consisted of dried lobelia tops, two ounces. This medicine was to be administered *all together*, or in parts, as the nature of the cases required. A dose of either of these powders, for an ordinary constitution, was stated in the specification, to consist of a teaspoonful, consisting of each of the parts equally mixed together, and washed down with half a pint of cold lye made from hickory shell bark. If this dose did not operate in fifteen minutes, a second was given, and if that did not operate, a third dose was given. The object of the medicine was to produce a free perspiration. How many patients this medicine cured or killed is not stated.

On August 25th, 1832, Horatio Howard, of Columbus, Franklin Co., Ohio, obtained no less than five patents for as many divers medicines. The first was for a diaphoric sweating powder, composed of butterfly root (Asclepias Tubarosa,) 1 pound; bark of bayberry root, (Myrica Cerifera,) 1 lb., ginger, one pound; bark of sasafras root, 4 ounces; colic root (Liatris Dubia,) 4 ounces; cloves and cayenne, 2 ounces each. These were to be finely pulverized and mixed. A dose for an adult was a teaspoonful mixed with sugar in hot water. These powders were given in cases of slight indisposition to induce perspiration, such as in chills. The drugs named are used by physicians for the purposes stated. We will describe other patented medicines in our next.

Recent American Patents.

Improvement in Telegraph Receiving Magnets—By Andrew Coleman, of Perth Amboy, N. J.—This invention has for its object the compensation of the varying forces of the electric currents, thereby avoiding the necessity of any manual adjustment of the spring or its equivalent, by which the armature is suspended. It consists in constructing the armature in the form of a lever, having its fulcrum variable under the influence of the variable magnetic force, in such a manner that the spring, or its equivalent, is made to act with a power proportionate to the strength of the magnetic current. We learn that this improvement is used with the highest advantage in connection with Morse's Telegraph.

Improved Subsoil Plow—By Pells Manny, of Waddam's Grove, Ill.—Consists in the employment of a circular rotating coulter, or knife, in front, which cuts the sod; behind the coulter is a share, which turns the furrow; be-

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hind the share, and lower down, is a mold-board, which enters deeply and disturbs the sub-soil, the whole being combined with a single plow beam, and drawn in the common manner.

Improved Fish Hook.—By J. T. Buel, of Whitehall, N. Y.—The nature of this invention consists, first, in having the upper part of the shank of the hook, which is made solid or in two parts, terminate in a small barb, whereby a "minnie" can be secured upon the hook more permanently, and in a position to insure the capture of the fish so surely as he bites. Also in having the hook thus constructed, made in two parts, so as to allow of the lower barb being turned out of line with the upper one, and so constructing the upper barb that an elastic eye shall be formed by it and the shank, whereby an artificial minnie may be conveniently placed on or removed from the shank, and a natural minnie substituted for it and twisted spirally, and thus caused to spin similar to an artificial bait when in the water. Also combining with the lower barb of the improved hook, one or more minnie barbs, in a manner to form a "minnie gang," and having one of the minnie barbs turn free of the lower barb of the improved hook, so that when desirable, a spiral twist may be given to the natural minnie.

We have just received from the inventor some very substantial evidences of the practical value of his invention, in the shape of a lot of fish, caught on Lake Champlain. Among them is a specimen of the "Maskalounge," which weighs ten pounds and a quarter. He states that it is one of the finest kinds of fish known, and that in some instances they weigh as high as 45 lbs. We can fully endorse to the latter part of his statement, for a more delicious fish never tickled our palate.

Improved Seed Sower—By George I. Bitler, of Lancaster, Ohio.—In this machine there is an ingenious arrangement for regulating the escape apertures of the seed, so that a larger or smaller quantity can be planted, per acre, as desired. The devices for adjusting the parts are very convenient. Altogether this is a good invention and merits an extensive introduction. Its use will save much time and labor to farmers.

Combined Weather Strip and Lock for Windows—By Alfred Speer, Passaic, N. J.—Consists in providing a longitudinal groove in the bottom and top of the sashes, sill, and head piece of the frame, and arranging between said grooves a thin horizontal strip, and causing the same to enter the grooves when the windows are shut, so as to close up all cracks and render the sashes water-proof and also lock them securely. An engraving of this invention may be found in No. 12, present volume of our paper.

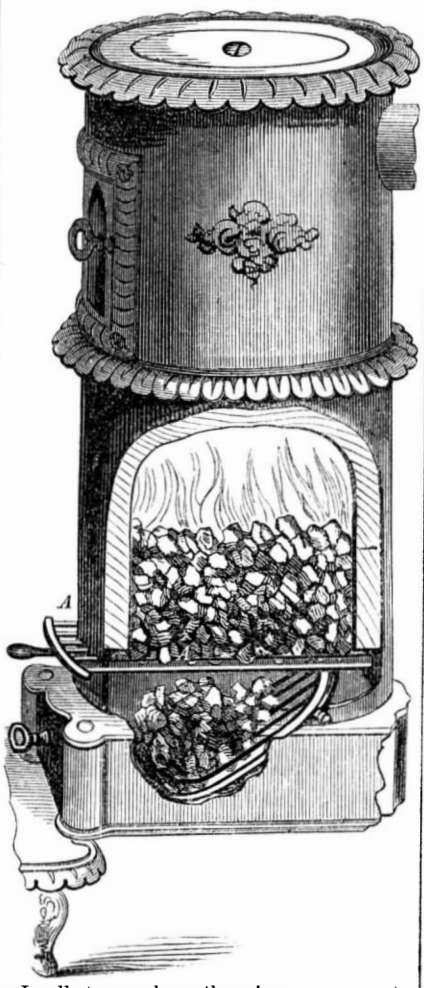
Cotton Gin.—By J. H. Kenyon & J. Hollingsworth, of Chicago, Ill.—This invention is intended chiefly for ginning Sea Island and other long staple cotton. It consists in the employment of toothed rollers, husk fans, and a clapper provided with a slotted bottom, and also in the employment and use of inclined passages and rollers arranged and operating so as to gin the cotton in the most perfect manner without breaking or injuring its fiber.

Machine for Making Tin Ware—By Shepard and Stow, Plantsville, Conn.—The object of this invention is to insert the binding wire and turn the edges of tin vessels. It consists in the employment of an adjustable rotating guide, which is placed on one of the rollers of the machine; also in the peculiar arrangement of a forming roller, whereby the box, kettle, or other article to be operated upon will be fed through the machine by the rollers without the aid of the operator. This improvement effects an important saving in labor.

Electric Printing Telegraph.—By Albert J. Partridge, of Southbridge, Mass.—In the use of this telegraph an instrument is employed at every station, which is both a composing and printing instrument, and is capable of receiving communications without printing, and also of taking a copy at the station from which the communication is sent. The several instruments of the line are connected by a circuit composed of a single conducting wire and the ground. The invention combines several very ingenious devices, which it would be impossible to describe clearly without engravings.

Improvement in Coal Stoves.—Anthracite coal is one of the best and most extensively used fuels known in this part of the country; and almost the only inconvenience connected with its employment is its tendency to form lava or clinker, which adheres to the sides of the stove, clogs up the interior, prevents proper combustion, checks the radiation of heat, &c. In ordinary stoves there is no method of extracting the clinker, except by letting the fire go out, and then removing the whole contents of the stove. Nobody wants to do this, especially on a cold winter's day or evening.

The improvement shown in our engraving consists of a supplementary grate, A, which is introduced through apertures made in the side of the stove for that purpose, above the lower grate. If the stove is full of fire, and it is desired to remove the clinkers, the grate, A, is shoved in as shown, and the upper part of the fire is supported, while the lower part where the clinkers form, may be removed by tipping the lower grate in the usual manner.



In all stoves where there is an open grate, the supplement may be thrust directly through the fire in front, and thus give the required support to the upper part while the obstructions are being removed.

The saving in time and kindling wood which this simple contrivance effects, is considerable, not to mention its great convenience. It permits a thorough removal of all clinker at any time, without putting out the fire. It is applicable to nearly all forms of coal stoves, furnaces, &c.

Mr. Benj. F. Foering, of Philadelphia, Pa. is the inventor, of whom further information may be obtained. Patented March 4, 1856.

Recent Foreign Inventions.

Gunpowder—E. Hall, of Dartford, Eng., has obtained a patent for an improved method of sprinkling the gunpowder materials while under the milling process. Under the old system of wetting with a watering-pot the distribution of the water was not uniform, and the powder was not properly damped. Mr. Hall's apparatus consists of a pump, which slowly conveys water to a cistern above each mill, and having a series of sprinkling pipes, connected with an index nicely adjusted, and a stop-cock, to take off the supply while one is being taken off and another put on.

Portable Gas Apparatus—Messrs. Bridges & Adams, of Westminster Road, London, have taken out a patent for an improvement in portable gas apparatuses to supply the gas economically when not more than ten or twelve lights are required. It consists of a stove with movable retorts, that when one is burned out it may be replaced with facility; a hydraulic main and tar cistern is contained in one vessel, and another vessel adjoining serves as a purifier. The apparatus takes up little more than six square feet of space, and is well adapted for houses in isolated situations, while other and larger sizes will be found equally efficient for large or small factories, railway stations, &c. The apparatus is designed for making gas from coal, consequently it requires more ajuncts than those apparatuses exhibited at the last Fair of the American Institute for making gas from resin, oil, and wood. The flexible gas holders connected with some of these is an excellent improvement for a portable apparutus over the old iron gas holders.

Ventilating Mines.—The London *Mining Journal* contains an account of a new method of ventilating mines patented by T. Coulson, England. It consists of a reservoir, or hydro-pneumatic box, placed on one side the adit level, supplied with water from a cistern on the surface. A metallic tube descends from the cistern to the vessel in the adit, and the supply is regulated by a self-acting valve. At the top of the metallic tube is a glass one, nicely regulated by a slide, by suspending which, at a certain point, admits no more water than is necessary. To draw in the largest possible quantity of air a vortex is formed, and a continuous stream of air and water varying in proportions according to the distance between the reservoirs and the hydro-pneumatic box, is conveyed from the former into the latter. Here the water and air are separated; the former escaping at the self-acting valve, and the latter being forced through a main tube, which branches off to any part of the mine. At one mine it is now working with a small stream of water, discharging more than one thousand gallons of pure air per hour, at a distance of nearly two hundred and fifty fathoms from the hydro-pneumatic box. This mine must have been abandoned, or a new shaft have been sunk, involving a great expense; the apparatus has completely resuscitated it.

Volute Springs to the Safety Valves of Locomotive and other Boilers.

The following is the substance of a paper on the above subject recently communicated by J. Baillie, and read by Robert Stephenson before the Institution of Civil Engineers, London:—

The volute spring, stated to have been invented by Mr. Baillie, the Locomotive Superintendent of the Central Hungarian Railway, was described to consist of a single plate of steel, wound spirally in a conical shape, sustaining pressure and deflection in reference to its breadth instead of thickness, and was constructed of thicker and deeper plates according to the increased strength desired. The effect attained by this form of applying steel to resist pressure, was found to be such that equal loads were sustained by one-third the weight necessary for elliptical springs of like capabilities and power. From the peculiar mode in which the rigidity and elasticity of the material was applied in these springs, although so very light, they were not liable to break, or to be injured by any amount of force if properly fitted; and the experience of upwards of seven years had proved that they were very economical for all railway purposes. The same experience had proved the unfitness of india rubber, or other substitutes for steel, for mechanical application, where great wear and tear had to be sustained, whilst the elliptical form of spring had many disadvantages, which were obviated by the direct action, the compactness, and the elasticity of the volute; and the saving effected by their adoption was not only in the first cost, which was great, but also in repairs, owing to the simple construction and application of the volute; whilst, in addition, much of the iron-work necessary in fitting ordinary springs was saved.

It was stated that the volutes had been adapted not only to an immense number of locomotive engines, both abroad and in England, but also to tenders, wagons, tracks, and carriages for bearing, buffer, and traction springs, and in all cases with decided advantage, as to space and durability, over the ordinary elliptical springs. They were also now beginning to be employed as auxiliary springs for common road carts and wagons; and they were proved to be very valuable for many kinds of machines liable to sudden pressure, such as any unyielding substance passing between rollers, which would otherwise almost inevitably be fractured.

Concurring in the almost universal opinion of the inadquate dimension of the safty valves being the most fruitful cause of explosion, and at the same time appreciating the practical difficulties attendant upon increasing the number or the area of the ordinary valves, with the present system of weighting them, Mr. Baillie determined to try whether a safety-valve of large area could not be conveniently and steadily held down by a number of volute springs of known power; this appeared to act extremely well, and in order to test the new system, in comparison with the ordinary method, a safety-valve of 12 inches diameter, held down by seven volute springs, was adapted to a locomotive boiler on which there was also an ordinary valve of 3·6 inches diameter, weighted with the usual lever and spring balance. The boiler possessed an area of heating surface of 890 square feet; but lest the cylinder should take too much steam, the engine remained stationary during the experiments, and the fire was urged by a constant jet of steam, of 1-2 inch in diameter, into the chimney. The two valves were equally weighted to a pressure of 64 lbs. per square inch. The large valve was then fastened down, and in four minutes the pressure of the steam had increased to 105 lbs. when the small valve had risen 1-12 inch, and the experiment was stopped, as the valve could not discharge the steam so fast as it was generated.

The small valve was then screwed down, and the large valve was set free; in four minutes the pressure had only increased from 64 lbs. to 76 lbs per square inch., or 12 lbs., when the valve rose 1-24 inch.; and although the fire was powerfully urged for upwards of half an hour, the pressure of the steam could not be raised beyond 76 lbs., as the large area of the safety-valve allowed all the steam that was generated to escape freely.

These experiments were considered so satisfactory, that the system of using volute springs for the valves had been generally adopted for the boilers of the locomotives of the Hungarian and Austrian Railways, upon which Mr. Baillie was engaged.

Tanneries and Railroads.

Since the opening of the Erie and adjacent railroads, extensive tanneries have been established along the lines in localities where bark can be obtained in largest quantities and at least expense. A tannery of the largest class makes sad havoc with timber, using up, on the average, nearly a square mile of hemlock trees per annum. The amount of bark consumed every year by a first class tannery, if estimated in cords, may be set down as not less than 6,000. Each acre of woodland produces from 8 to 25 cords of hemlock bark. It was formerly found necessary to locate tanneries by the side of some stream of water of sufficient motive power, to drive the machinery for grinding the bark, rolling the leather, &c., but steam engines are now extensively used, and the spent bark which was once considered an encumbrance, furnishes them fuel. Furnaces have been and are now used for burning the wet spent bark, and some of these, it is said, operate well; but it has always appeared to us that the only way to economise the spent bark was to sun dry it, and then employ it for fuel. Solar evaporation costs nothing, whereas the water in bark absorbs a great deal of heat in the furnace to drive it off in the state of steam. There are now some large new tanneries in Oswego County. The northern shores of Oneida Lake contain much fine hemlock timber, the bark of which is excellent for tanning. But it appears to us that our tanneries should now be devoting some attention to the cultivation of some shrubs for tanning purposes, the annual crops of which would be sufficient for their business. The hemlock and oak forests are fast disappearing, and when they are gone the tanners must seek some substitute. Young blackberry bushes ground up fine are excellent for tanning fine calf skin for upper leather.

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TO CORRESPONDENTS.

J. R., of N. Y.—A turbine wheel is the most simple and the cheapest, but under a twelve foot head, if you have sufficient water, you can drive one run of stones and a saw, easily, either with a breast or turbine wheel. The millwrights in your neighborhood are acquainted most with the breast wheel. It will take ten horse-power to drive one run of stones, and the same to drive one saw, but you can also drive them with one half this amount of power. It all depends upon the speed you wish to give the saw and the stones.

J. W., of C. W.—The seed of an apple will not produce a pear, although it may be taken from an apple graft on a pear tree. "Every seed bringeth forth after its kind." A very weak solution of gum arabic is the best varnish for pencil drawings, but it is difficult to apply it, as the pencil lines are liable to blur.

E. C., Jr., of Mass.—Your window fastener is not new or patentable.

J. M. M., of Ill.—James McArthur resides at Waterloo, N. Y.

J. F., of Va.—You can make a varnish for grates, by dissolving 3 lbs. asphaltum, and half a pound of shellac in a gallon of turpentine, adding a little lamp black.

R. W. T., of N. Y.—The cause of your wheel performing so irregularly may be owing to one part of its rim be ing heavier than another. You can easily find out this by careful observation, after shutting off the water. If it always stops with the same buckets downwards you may be sure that its rim is unbalanced.

Z. J., of Me.—Unless fish are salted very soon after they are caught, they will be of inferior quality. They begin to decay sooner than flesh meat. Do not suffer incipient decomposition to commence. There is too much carelessness exhibited by our fishermen in salting their fish It is a shame to them that so much wretched salt fish is to be found in our markets.

C. H. McC., of Wis.—Your seed planter is similar to others we have seen, and could not be patented. The flexible seed tubes are not new; they have been used on many machines.

J. D., of N. Y.—We cannot give you the information required respecting the building of your house. You must first consider what you want, and then endeavor to find out how to supply your wants, and for this purpose con sult a builder.

S. R. I., of R. I.—You can easily obtain a rotary motion without the use of a crank in your steam engine; but then you will have to sacrifice simplicity for complexity, —a good arrangement for a bad one.

E. H., of N. Y.—We always maintained that the Fire Annihilator might be useful in the holds of ships; but for general purposes, it is insufficient to prevent or extinguish fires.

W. T., of Mass.—If you use a weft finer than your warp, you will make a much finer fabric to appearance than if the "numbers" of the warp and weft were equal. Thus, if you use No. 30 warp and No. 36 weft, you will make more beautiful cloth than if you employ No. 33 for warp and weft.

L. W. J., of Phila.—Write an article brief, but comprehensive, on wooden versus iron ships, giving facts and circumstances, and we will publish it. Our object is to advance science and art by the dissemination of relia ble information and the correction of popular errors.

E. M., of Ill.—The most available situation we know of for the practice of your art is that of reporter for a newspaper. We do not know of any opening for you here.

C. H. P., of Mich.—Your saw mill appears to be well conducted. We have received a flood of letters relating to what saws have done, and cannot even publish the substance of them. The shingle machine which you have named ought to be secured to the inventor it is such an excellent improvement.

J. C., of Tenn.—Your last letter is very unreasonable. The answer which we made to your communication on the rotating globe was between you and us, and it was given for your own sake, because no other person reading it could come to a different conclusion than we did. With the explanations and principles laid down in your communication we are agreed, so far as they relate to the laws of motion. They are not disputed, and were not required to be enunciated by any remarks ever made by us. Your wish shall be gratified to the letter.

V. S., of S. C.—We will endeavor to give you the information desired in a week or two at furthest.

J. W., of Pa.—Yours will appear in a week or two.

R. S., of N. J.—The steam and ether engine should have a fair test with the most improved steam engine, and not with some miserable worn out one.

S. & W., of Mass.—We can give you two other rules be sides those published for calculating the power of effluent water, but the results would be exactly the same.

H. St C., of Mich.—We know of one case of blindness caused by the use of sulphate of quinine for the Isthmus fever. It should be taken with great circumspection in every case.

W. S. S., of Ill.—A tin roof would be more expensive than a shingle one for your house, and we would advise you to put on the latter. If you immerse the shingles in a solution of alum and sulphate of oopper—one pound of each to ten gallons of water—then dry them thoroughly before putting them on, and they will be rendered nearly fire-proof.

S. R., of Ill.—We cannot tell you the cost of cement roofing. Blake's fire-proof cement for roofs is sold in all the large paint stores in this city. If you mix equal parts of pitch and tar, and add some fine sand with it, and lay it on hot, it will make a good water-proof roof. Fine gravel and sand should be pressed down on its surface before it is cold. The coarse boards of the roof should be first covered with thick paper or coarse cotton cloth, tacked down, and on this let the cement be laid. We prefer a shingle roof to such a cement one. The tar and pitch must be boiled together in a caldron, and used hot as wanted.

T. Y. S., of Pa.—Coal locomotives will yet supersede wood burning ones; it must be so, because wood is becoming so dear. Pennsylvania will yet become the greatest manufacturing State in our country, we think, because its coal and other natural resonrces give it so many advantages over any of the other Atlantic States.

A. R. W., of Conn.—No substitute has yet been discovered to supply the place of fine oil in the woolen manu factures. Steam has been used with much success at the factory in Waterloo, N. Y., but not in other places that we have heard from. We do not think your compound is as good as oil: but if you have made sufficient experiments you are the best judge; it is new, and if good may be patented.

J. T., of O.—A propeller with double angular blades could not be patented, as it is old and well known.

H. J., of N. J.—You can color paper with the very same dyes that are employed for cotton. You will find receipts for the different colors in our last volume. If you boil the dyewoods and use strong solutions you may apply them with a sponge to the surface of the paper. Redwood boiled with a little sumac and alum makes a red color.

Money received at the SCIENTIFIC AMERICAN Office on account of Patent Office business for the week ending Saturday, April 26, 1856:—

J. T. Y., of O., $25; J. K. D., of N. Y., $30; J. L. P., of Miss., $25; J. R. C., of Ind., $50; C. H. P., of Conn., $25; D. L., of Mass., $30; J. F. H., of Ill., $25; J. E. M., of N. Y., $25; B. G., of Mass., $20; J. V. J., of Mich., $25; E. L. B., of N. Y., $25; J. I., of Conn., $30; J. B. C., of O., $30; R. G., of N. Y., $100; E. N., of Mass., $27; H. C., of O., $25; W. G., of Mass., $30; L. H. S., of Mich., $20; T. G. B., of L. I., $10. C. P. C., of Mass., $25; W. J., of N. Y., $25; C. O. L., of Ill., $30; W. E., of Ill., $29; J. A. W., of Ky., $30; J. S., of R. I., $30; E. A. C., of N. Y., $40; E. D., of N. Y., $30; J. N. W., of N. Y., $30; G. W. S., of N. Y., $30; H. C., of Mass., $30; G. C. E., of N. Y., $30; A. S. M., of Vt., $55; J. E., of Pa., $25; W. B. L., of La., $25; W. & C., of Md., $1250; A. C. R., of N. Y., $30; G. D., of N. Y., $427: J. B. C., of N. Y., $30; D. D., of N. Y., $100; T. S., of N. Y., $260; G. & E., of N. J., $25; J. R., of N. Y., $210; W. J. S., of N. Y., $100 E. S., of Conn., $85.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, April 26:—

J. M. R., of Ga.; J. L. P., of Miss.; J. T. Y., of O.; C H. B., of Conn.; S. I. A., of N. Y.; J. E. M., of N. Y.; J. C., of N. Y.; J. V. J., of Mich.; E. L. B., of N. Y.; J. W. S., of O.; F. F., of Ky.; W. J., of N. Y.; H. C., of O.; E. N., of Mass.; A. G., of Ind.; M. & B., of S. C.; C. P. C., of Mass.; G. & E., of N. J.; J. P., of N. Y.; R. G., of N. Y. (2 cases); W. & C., of Md.; W. T., of O.; W. & U., of O.; J. R., of N. Y., (4 cases); H. S. N., of Conn.: W. J. S., of N. Y., (2 cases): J. F. H., of Ill.

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Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

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PAGES PATENT PERPETUAL LIME KILN, will burn 100 bbls. lime with three cords of wood, every 24 hours, likewise my coal kiln will burn 150 bushel with 1 tun bituminous coal in the same time; coal is not mixed with limestone. Rights for sale.
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32 eowtf S. C. HILLS, 12 Platt st., N. Y.

TO INVENTORS AND OWNERS OF PATents—The undersigned have established a house at St. Louis for the introduction, sale, and exhibition of machinery, inventions, and patent rights. They will receive models and samples for exhibition, and will buy or sell rights for Iowa, Illinois, or Missouri, when terms suit, address JAS. W. MACDONALD, & Co., 87 4th st., St. Louis, Mo.

P.S. J. W. Macdonald may be consulted or addressed for a few weeks, at 343 Broadway, New York. 1*

LYON'S COPPER LIGHTNING CONDUCTOR—Patented July 11, 1854. The subscribers have purchased the entire interest of the patentee in the manufacture of these celebrated conductors, and are prepared to furnish them with the appropriate fixtures to all parties holding the right to territory, in any quantity and on short notice. Circulars sent on application. Address, BRITTAN & EDMONDS, Lockport, N. Y. 27 4 oam

RARE OFFER—I have the best Rat Trap ever invented; it will set itself, and catch rats all night; they can be made for about six cents apiece, and I will sell (under the application for a patent) the right for any State in the Union, for the small sum of $30. I will furnish drawings to any person who will forward me eight postage stamps. Address Wm. B. HALLERTON, Boston. 1*

$300 TO $5000—For sale, State, county, city, and town rights, to use a recently patented machines, to make and frame friction matches direct from the block. This is an invention which secures a saving of from one-half to three-fifths of the labor of the ordinary methods of manufacturing the article. Address, O, H. MOSES, Peekskill, N. Y. 1*

THE NEW BRICK MACHINE has been in successful operation for more than two years. The one at my yard is driven by a 6-horse portable steam engine, which cost $635—makes two thousand one hundred bricks in an hour, or average 20,000 in ten hours. The clay is taken from the bank, passed through a pulverizer which frees it of stone, thence to the pit, where it receives the water pumped up by the engine, and then to the machine. Price $400. A smaller machine is worked by a horse—makes one thousand per hour. Price $250. For further particulars (in a pamphlet containing full instructions on brick-burning,) address FRANCIS H. SMITH, Sun Building, Baltimore. 34 2*

NOTICE—This certifies that H. B. Simonds has sold me all right (for the United States) in his Improved mode of Attaching Hubs to Axles. CLARK SIMONDS, 2d, West Hartford, Vt. 34 2eo*

NOTICE TO CONTRACTORS—Office of the Long Dock Company, Jersey City, April 15, 1856. Sealed Proposals will be received at this Office until the 5th day of May, prox., at 10 o'clock, A. M., for grading two miles of railroad, including a double track tunnel about 4000 feet long. The tunnel is located in Hudson City, about one mile from the Hudson river, and through a ridge of trap rock known as Bergen Hill. The whole work to be completed on or before the first day of November, 1857.—Specifications, plans, profiles, sections, &c., of this work may be seen at this Office, or at the Office of the New York and Erie Railroad Company, Erie Place, West Street, City of New York. HOMER RAMSDELL, President L. D. Co. 33 3

SAMET MACHINES—A. NEWBURY & CO., of Windham Center, N. Y., are manufacturing a superior article; having been thoroughly tested for a number of years, they are found inferior to none in cheapness, durability, and in the quality of their work. Price $50.
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CAUTION—The public are hereby cautioned against purchasing any right for improvement in Horse Shoes. Patented 25th of July, 1854 by W. H. Towers, from Geo. S. Earle or E. B. Strong, as the power of attorney under which such sales may be attempted to be made was revoked some months since. W. H. TOWERS,
32 4*

1856.—WOODWORTH'S PATENT Planing, Tongueing and Grooving Machines.—The subscriber is constantly manufacturing, and has now for sale the best assortment of these unrivalled machines to be found in the United States. Prices from $85 to $14.50. Rights for sale in all the unoccupied Towns in New York and Northern Pennsylvania, JOHN GIBSON, Planing Mills, Albany, N. Y. 30 3m*

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THE NEW YORK DAILY SUN—Is forwarded by the early mails to country subscribers at $4 per annum, or $1 per quarter, payable in advance. The postage under the present law is as follows: to any post office in the State of New York, 78 cents per year, payable quarterly in advance. Out of New York State, but within the United States, $1,56 per year, payable quarterly in advance. MOSES S. BEACH, Publisher,
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MACHINERY—S. C. HILLS, No. 12 Platt street, N. Y., dealer in Steam Engines, Boilers, Planers, Lathes Chucks, Drills, Pumps; Mortising, Tenoning, and Sash Machines, Woodworth's and Daniel's Planers; Dick's Punches, Presses, and Shears; Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting, Oil, &c 26 e3w

H. WELLS & CO., Florence, Hampshire Co., Mass.—Manufacturers of double and single patent premium Circular Saw Mills, of various capacities and styles, unsurpassed in point of Finish, Durability, and Utility. Morrison's Patent Shingle Machines, which rive, shave, and joint perfectly, 60 shingles per minute.—Self-Setting, Shingle, and Lath Sawing machines. Carpenter's Patent Rotary Force Pumps, admitted the best in the United States. Saw Mandrels, Sets and Set Punches, Mill Gearing, Shafting, &c. Orders by mail will receive prompt attention, and Cut, Circulars and Price Lists furnished when desired. 26 6t eow*

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CIRCULAR SAWS—We respectfully call the attention of manufacturers of lumber to the great improvements recently introduced in the manufacture of our Circular Saws. Being sole proprietors of Southwell's patent for grinding saws, we are enabled to grind circular saws from six inches to six feet with the greatest accuracy and precision. The impossibility of grinding a saw without leaving it uneven in thickness has always been acknowledged by practical saw makers. This causes the saw to expand as soon as it becomes slightly heated in working. When this takes place the saw loses its stiffness, and will not cut in a direct line. We will warrant our saws to be free from these defects; they are made perfectly even in thickness, or gradually increase in thickness from the edge to the center, as may be desired. As there are no thick or thin places, the friction on the surface of the saw is uniform, consequently it will remain stiff and true, and will require less set and less power. Will saw smooth, save lumber, and will not be liable to become untrue. This is the oldest establishment now in existence for the manufacture of circular saws in the United States, having been established in the year 1830. Orders received at our Warehouse, No. 48 Congress st., Boston.
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SCHENCK MACHINERY DEPOT—163 Greenwich street, New York, keeps always on hand Lathes, Planers, Drills, Steam Engines, Woodworth's Patent Planing Machines, Belting, &c., in great Variety. Tools furnished of any size, to order, and of the best quality.
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BOILERS FOR SALE—Three Cylinder Boilers, 44 inches diameter, 30 feet long, with two 13-inch flues each, with steam drums 30 inches diameter and 5 feet high; and Cross Boiler 36 inches diameter, and 12 feet long; safety and check valves all in complete working order. Also, a new set of Van Sickle's Patent Salamander Grate Bars for a Furnace, 5 feet by 10. Apply to
HECKER & BROTHER,
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VERTICAL STEAM ENGINE and Boiler for Sale at a bargain. The Engine is nearly new, and well finished. The cylinder is 9 inches; the fly wheel is a band wheel 5 feet in diameter, face 14 inches, turned off, weight 1350 lbs. The boiler is 20 feet long, 42 inches in diameter, 1 flue 17 inches, well braced wrought-iron heads; it is very strong, and has been in use about six months; is about 15-horse power. Cost $1200, will be sold or $675 cash; delivered on ship board. Apply to MUNN & CO., at this office.

MACHINISTS' TOOLS.—Meriden Machine Co have on hand at their New York Office, 15 Gold street, a great variety of Machinists' Tools, Hand and Power Punching Presses, Forcing Pumps, Machine Belting, &c., all of the best quality. Factory West Meriden, Conn. 32 13*

CARPENTER'S ROTARY PUMP—For Pumping Hot or Cold Water, Lard Oil, &c. is (see good notice on both sides, in this paper, No. 29.) manufactured and for sale by D. C. HENDERSON, Sandusky, Ohio.
31 5*

THE AMERICAN PLATE GLASS CO. Having erected extensive works in East Brooklyn, (foot of North Sixth st.) are now prepared to execute promptly all orders for warded to them, for Rough Plate Glass, for Sky Lights, Floor Lights, Pavements, Deck Lights for vessels, &c. Also an entirely new article possessing the properties and beauties of Agate, called Chalcedon. This material supersedes Marble, in its superior quality and utility for the purpose of Flooring, Mantel Pieces, Table Tops, and Ornamental Architecture. All orders left at the Office of the Company will receive prompt attention. Office 420 Broadway. Rough Plate Glass in the Sheet at the factory, 1-4 in. 35c.; 3-8 in. 35c.; 1-2 in. 40c.; 5-8 in. 60c.; 3-4 in. 75c.; 7-8 in. 80.; 1 in. 85c.; 1 1-4 in. $1·25. Terms cash in 30 days. 27 13

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PATENT ALARM WHISTLE—For Speaking Pipes. The right of a limited number of the Southern States, of this valuable patent, for sale on reasonable terms. Apply to W. OSTRANDER, No. 57 Ann street, N. Y. 29 13

STEAM PUMPS AND FIRE ENGINES—Steam Pumping Engines for wrecking purposes, Irrigating and Draining Lands, Deep Mining Shafts, Quaries, and Excavations, Railroad Stations, Factories, Public Institutions, Hotels, Gas Works, Steamers, &c. Also a large and improved class of Pumping Engines for supplying Cities, Towns, and Villages. Apply to H. R. WORTHINGTON, 28 Broadway, New York City. 25 13*

OIL! OIL! OIL!—For railroads, steamers, and for machinery and burning—Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skilful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer.
F. S. PEASE, 61 Main st., Buffalo, N. Y.

N. B.—Reliable orders filled for any part of the United States and Europe. 33 tf

NORCROSS ROTARY PLANING MACHINE.—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb, 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.

Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS,
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Office for sale of rights at 208 Broadway, New York Boston, 27 State street, and Lowell, Mass, 19 6m*

GRAIN MILLS—EDWARD HARRISON, of New Haven, Conn., has on hand for sale, and is constantly manufacturing to order, a great variety of his approved Flour and Grain Mills, including Bolting Machinery, Elevators, complete with Mills ready for use. Orders addressed as above to the patentee, who is the exclusive manufacturer, will be supplied with the latest improvements. Cut sent to applications, and all mills warranted to give satisfaction. 29tf

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AGENCY FOR THE PURCHASE AND SALE of valuable patents and inventions, T. H. LEAVITT, No. 1 Phœnix Buildings, Boston. None but matters of real merit and utility will receive any attention. Circulars containing further information may be had on application. 29 12*

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Science and Art.

Signals and Color Blindness.

We recently alluded to an article in the last number of the *North British Review*, in which it was stated—as taken from Dr. Wilson's work—that one person out of every eighteen was unable to distinguish different colors. The subject is one which deserves more than a mere passing notice. If it be true that color blindness is as prevalent as Dr. Wilson has stated, then all the engineers and switchmen on our railroads, and all the pilots on our rivers, should be thoroughly examined respecting their capacity to distinguish colored signals. This is something that never has been thought of, and yet we can easily conceive what consequences might ensue on a railroad by an engineer mistaking a red for a white signal. Red flags, red globes, red lights, and other colored signals, are used on railroads and steamboats, and no doubt they always will be used, because they are so convenient. While in themselves they are good and necessary, it is the duty of those companies using such, to see to it, that those whom they employ, are not defective in recognizing and distinguishing them.

Although it is our opinion that color blindness is not so common as has been asserted; still nothing should be left in doubt, when the safety of life is concerned, as on our railroads and night steamboats.

Color blindness is something that baffles the best opticians to account for satisfactorily,—indeed the power of vision, in itself, is shrouded in much mystery, like that of every other sense man possesses. As far back as 1684, Dr. Tuberville, of Salisbury, Eng., described the case of a young female, who could see very well, but no color besides black and white; and, singular to relate, she could sometimes see to read in a dark room. The famous chemist, Dr. Dalton, was unable to distinguish between red and green colors; and Dugald Stewart, the philosopher, had the same defect of vision. This defect of vision has been long known to have had an existence, but was supposed to be limited to a very small number of persons. Dr. Wilson's experiments were instituted to discover the extent of color blindness and, if possible, its nature. Its prevalence has astonished himself. Out of 1,154 persons examined indiscriminately, he found 65 defective in distinguishing colors.

Red and green are often confounded together, and some persons that could distinguish these within one foot of their eyes, failed to do so when they were removed from twelve to fifteen feet. These persons would not answer for safe signal-men. The greatest number confound blue with green, and the next greatest number confound brown and red with green.

Among a number of possible sources or influences upon color vision, Dr. Wilson mentions the *yellow* spot on the retina, and the colors of the choroid Soemmering discovered this spot; it is found only in the human retina, that of apes, and some lizards. The true character of this spot and its uses is unknown. It has properties different from every other part of the retina, and is the spot of most distinct vision.

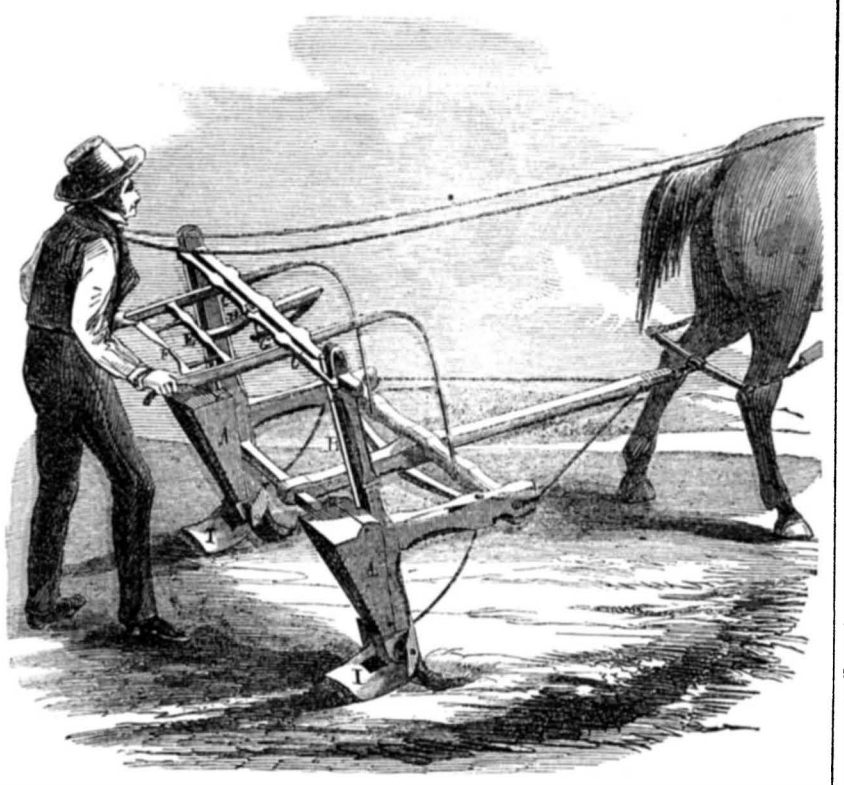
The *cerebral* theory of color—that of the phrenologists, is stated to be disavowed by all natural philosophers. The cause of color blindness—whether in the coating of the eye or in the nerves, no one can tell at present. There are just as great differences in the senses of taste, smelling, hearing, and feeling in persons, as in distinguishing colors. One person can distinguish musical notes correctly and another cannot, and we may never know the reason. It is enough for the present to know that color blindness does exist, and that it is more prevalent than was supposed, in order for us to direct attention to it, for the reasons already given.

New Seed Planter.

The improvement shown in our engraving is the invention of Messrs. R. & W. L. Gebby, of New Richland, Logan Co., Ohio. It is intended principally for the planting of corn, but it may be used for other species of grain.

A A are the seed boxes, in which are slides, B, connected with levers, C, the inner ends of which rest on the tongue, D; this tongue projects from the cross bar, E, which is pivoted, and is moved by pressure on the small cross bar, F. The extremities of bar, F, terminate near the handles of the machine, and the planting is done by the attendant, who touches the bar, F, with his thumb, whenever he wishes to deposit the kernels of corn for a hill. By pressing bar F, the slides, B, are operated, through the levers before-named. G is a spring which brings up the slides after they have been pressed down. Two hills are thus simultaneously planted by one pressure of bar,

IMPROVED SEED PLANTER.

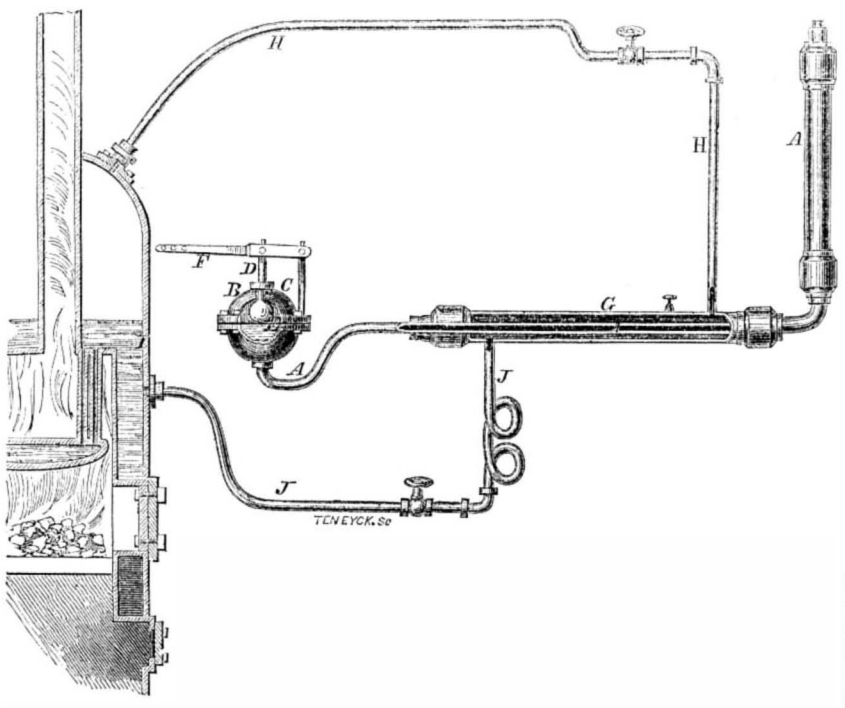


F. I I are plates, which cover the seed after planting. The weight of the machine rests, in a great measure upon these plates, and thus compacts the earth properly, and tends to facilitate germination.

The operation of this machine very closely resembles hand planting. The attendant drops the seed at the desired spot; the seed boxes are near the ground, and the slides act with perfect certainty; the channels are large, and whether the soil be dry or damp, makes no difference with the planting. The machine may be used for planting in drills or hills; for replanting it is also useful. In nearly all other planters the seed is dropped at certain intervals, by the revolution of a cam or wheel, and the planting is not therefore under the control of the operator.

This machine is very light, simple, cheap, durable, and serviceable. By its use one man with a horse can plant from 16 to 20 acres per day with ease, so we are told. Single machines, still simpler, are made by the patentees, of whom further information may be obtained, by letter or otherwise. Patented Feb. 12, 1856.

IMPROVED SAFETY INDICATOR AND FEEDER FOR STEAM BOILERS.



Steam Boiler Indicator.

Many of the safety indicators and explosion preventors used on steam boilers depend for their operation upon a float resting upon the surface of the water within the boiler. When the water sinks below a certain level the float is expected to follow, and pull down the lever to which it is attached, thus sounding an alarm, moving a pointer, or opening the pump valve for the admission of more water. Some of these devices are very good, yet they are not entirely reliable, for occasionally the floats or levers get stuck, and refuse to operate.

The improvement herewith presented is quite different from the generality of Indicators. A is a cold water pipe extending from a tank or other supply, and terminating below the diaphragm, E, in the sphere, B. Resting on the diaphragm above is a plunger, D, which, when it rises or falls, operates the lever, F; this lever is connected with the feed pump and with an indicating pointer or whistle, as desired. Pipe A is enclosed for a portion of its length by another pipe, G, of larger diameter. Pipe G communicates, by means of tube, H, with the steam dome of the boiler, and also by means of tube, J, with the water in the boiler. The horizontal portions of pipes A and G are located on the exact level at which it is always desired to keep the line of water in the boiler, and so long as such level is maintained pipe G will be filled half with steam and half with water. But when the water in the boiler falls the water in pipe G will also fall and steam will occupy its place. The steam having a greater heat than the water, rapidly converts the water in pipe, A, also into steam, and thus causes an upward pressure on diaphram, E, which raises the plunger, sounds the whistle, and opens the pump.—As fast as the water rises in the boiler the water also rises in tube, G, reduces the temperature of pipe, A, condenses its steam, and removes the pressure from diaphragm, E, whereupon plunger D falls, and the pump is closed, &c.

This apparatus is one of great simplicity and certainty in its operations. It requires but a few minutes time to attach it to any steam boiler. One of them has been in use for some months on the steam boiler of our neighbor the New York *Sun* newspaper. The engineer informs us that its use effects a considerable saving in fuel, as it maintains a very even water line in the boiler, and prevents rapid alterations of pressure. He thinks it is a true safeguard against explosion or boiler burning, and says it is worth its weight in gold.

The above improvement is the invention of P. Clark, of Rahway, N. J., and was patented June 6, 1854. Shiverick, Malcom & Co., 290 Broadway, New York City, are proprietors of the patent, of whom further information can be obtained.

Discovery of Silver Mines.

Rich mines of silver ores are stated to have been discovered in the Mesilla Valley. We have no doubt but more rich mines of silver will yet be discovered in those regions. In the mountains of Northern Texas rich silver *lodes*, in all probability, will reward the first adventurous explorers. The mountains belong to the range in which the richest Mexican mines are located.

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